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August
1928

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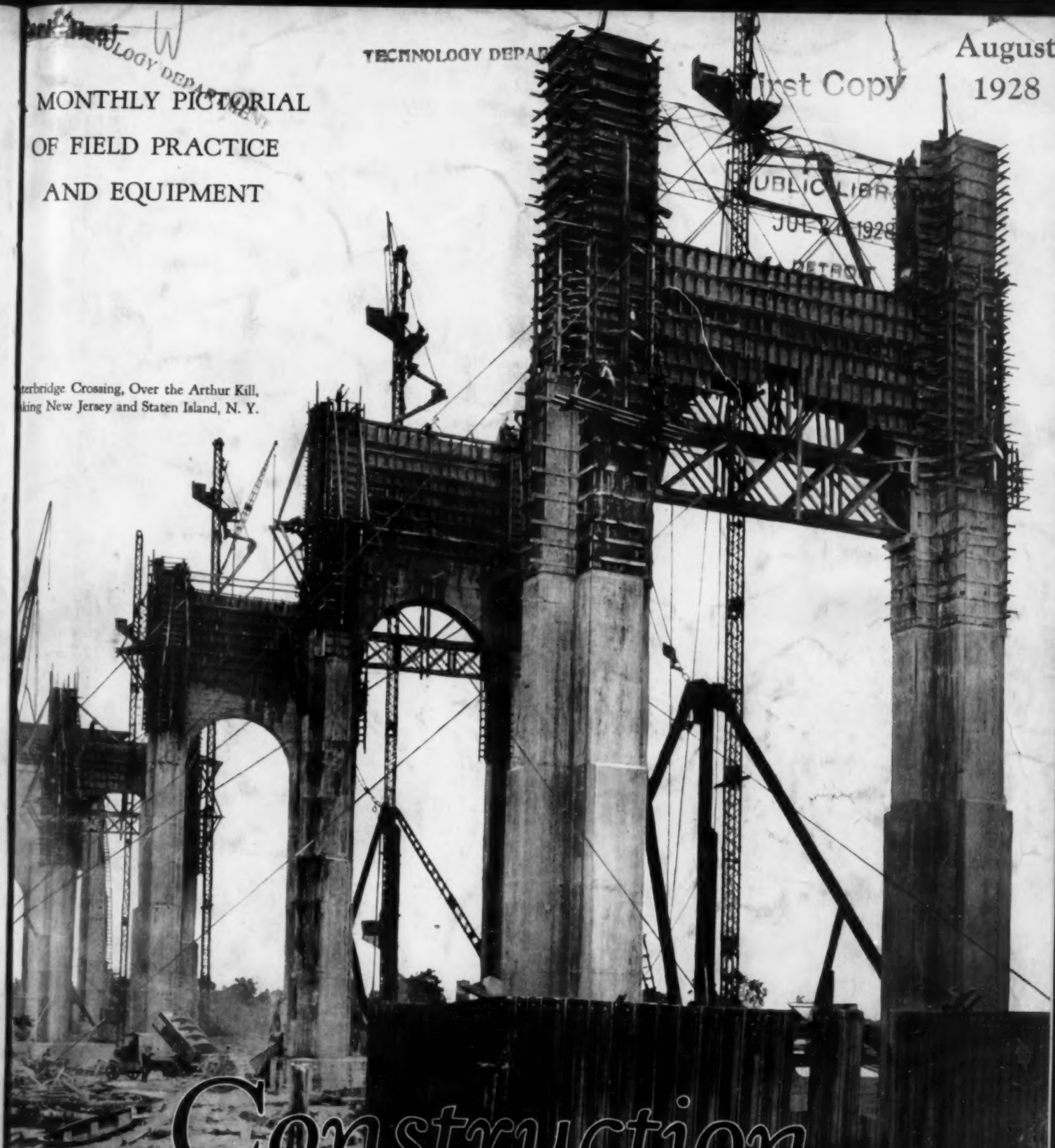

terbridge Crossing, Over the Arthur Kill,
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Construction Methods

McGraw-Hill Publishing Company, Inc., New York, N. Y.

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TECHNOLOGY DEPT.

What's Doing This Month

Looking it over with the Editor

A Big Paving Job

CONSTRUCTION methods employed on the largest single highway contract ever let by the State of New York form the subject of the leading picture story in this issue. Here is a job—the Conduit Boulevard, across Nassau County—calling for an unusually wide concrete slab, 40 ft., a total length of 16 miles and a cost of $1,400,000. To handle successfully a project of this magnitude requires, above all else, good organization and good plant. Johnson, Drake & Piper, Inc., the contractors, supplied both in the form of a skilled field force, numbering 400 men when work was at its height, and an investment of approximately $200,000 in modern equipment. The fact that four 27-E pavers were operated at one time gives an idea of the large scale on which work was carried on. The maintaining of progress schedules demanded the daily delivery of unusually large quantities of construction materials. In planning this phase of the work, the contractor selected industrial track and gasoline locomotives supplemented by a considerable amount of motor truck haulage. The job is a good example of the effective co-ordination of work covering an unusually large mileage, and traversing no less than 11 towns and villages, giving rise to special problems of cross traffic and local control in addition to those incident to the construction proper.

A Bond Made Stronger

The construction industry, with annual expenditures now exceeding $7,000,000,000 and employed personnel numbering about 3,000,000 men, has long since discarded its swaddling clothes and taken its rightful place in the front rank of big business. Today's contractor is a substantial citizen who conducts his work as a business, not as a gamble. He concerns himself with the same fundamental problems of administration, organization, finance and production as do other business executives. This closer bond between the technical and the business phases of engineering and construction is reflected in the merger, announced last month, of the A. W. Shaw Company, publisher of the well-known business periodicals, *The Magazine of Business* and *System*, as a division of the McGraw-Hill Publishing Company, Inc., publisher of *Construction Methods*, *Engineering News-Record* and nearly a score of other engineering and industrial journals.

For the readers of this journal there is a special significance in this consolidation, for it brings into close association two groups of magazines that are essentially complementary in character—the one, broad, covering the general problems of all business and the other, specialized, serving the particular needs of the major industries. From this association both groups of papers are bound to benefit.

CONSTRUCTION METHODS

A monthly review of modern construction practice and equipment

PUBLISHED BY
McGRAW-HILL PUBLISHING COMPANY, INC.
TENTH AVENUE AT 36TH ST., NEW YORK

Saying It With Flowers

"After reading two copies of *Construction Methods* I like them so much that I would like to subscribe."—Construction field man, North Carolina.

* * *

"Have just received my first copy of *Construction Methods*. I feel that I have been missing something."—Contractor, Canada.

* * *

"Too valuable to miss."—Contractor, Ohio.

* * *

"I find many new ideas and things of interest in your publication."—State highway engineer, California.

* * *

"I think *Construction Methods* is just fine now and getting better."—Builder, Ohio.

Plain and Fancy Fare

Caviar and cream puffs have their place, but the daily fare of the man on the job should include something less fancy and more sustaining. This principle applies to the editorial menu that a paper like *Construction Methods* offers to its readers. The big spectacular projects are interesting, of course, but the more prosaic, bread-and-butter operations, constituting a large percentage of the day's work for the average construction man, are equally important and should have adequate representation. In planning each issue, the aim is to strike the medium of a balanced ration. For the man interested in the big spectacular jobs, there are stories this month on the Arthur Kill bridges, the 16-mile Conduit Boulevard and the Starved Rock lock and dam. On the other hand, smaller and more ordinary operations are found in the Step-by-Step story on curb and gutter work, building a sewer at Springfield, Ill., and handling heavy grading in Missouri. You readers, therefore, can help yourselves to caviar or to corn beef and cabbage, depending upon your individual tastes.

Saving Seconds

"SAVE the pennies," said Poor Richard, "and the dollars will take care of themselves." On the construction job the wide-awake contractor knows the effect of saving seconds here and there. In a report on power shovel grading, the U. S. Bureau of Public Roads says: "The custom of loading the hauling units at the rear of the shovel (requiring a 180-deg. swing) is a very expensive practice." Side loading means a saving of about 4 seconds with a fast-swinging shovel — possibly twice that amount with a slow machine. Attention to saving seconds may easily result in 180 instead of 150 dipper-loads per hour. Spot wagons or trucks, therefore, for a short dipper swing.

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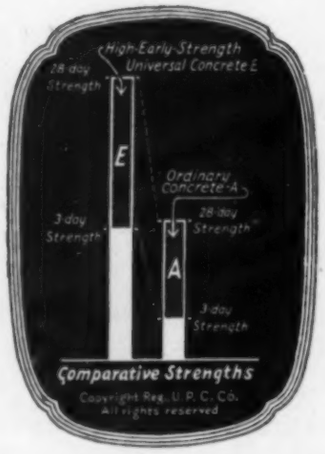

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A monthly pictorial of field practice and equipment illustrating successful construction, maintenance and material-handling methods for general construction, highways, buildings, industrial plants and public works and utilities

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Editor

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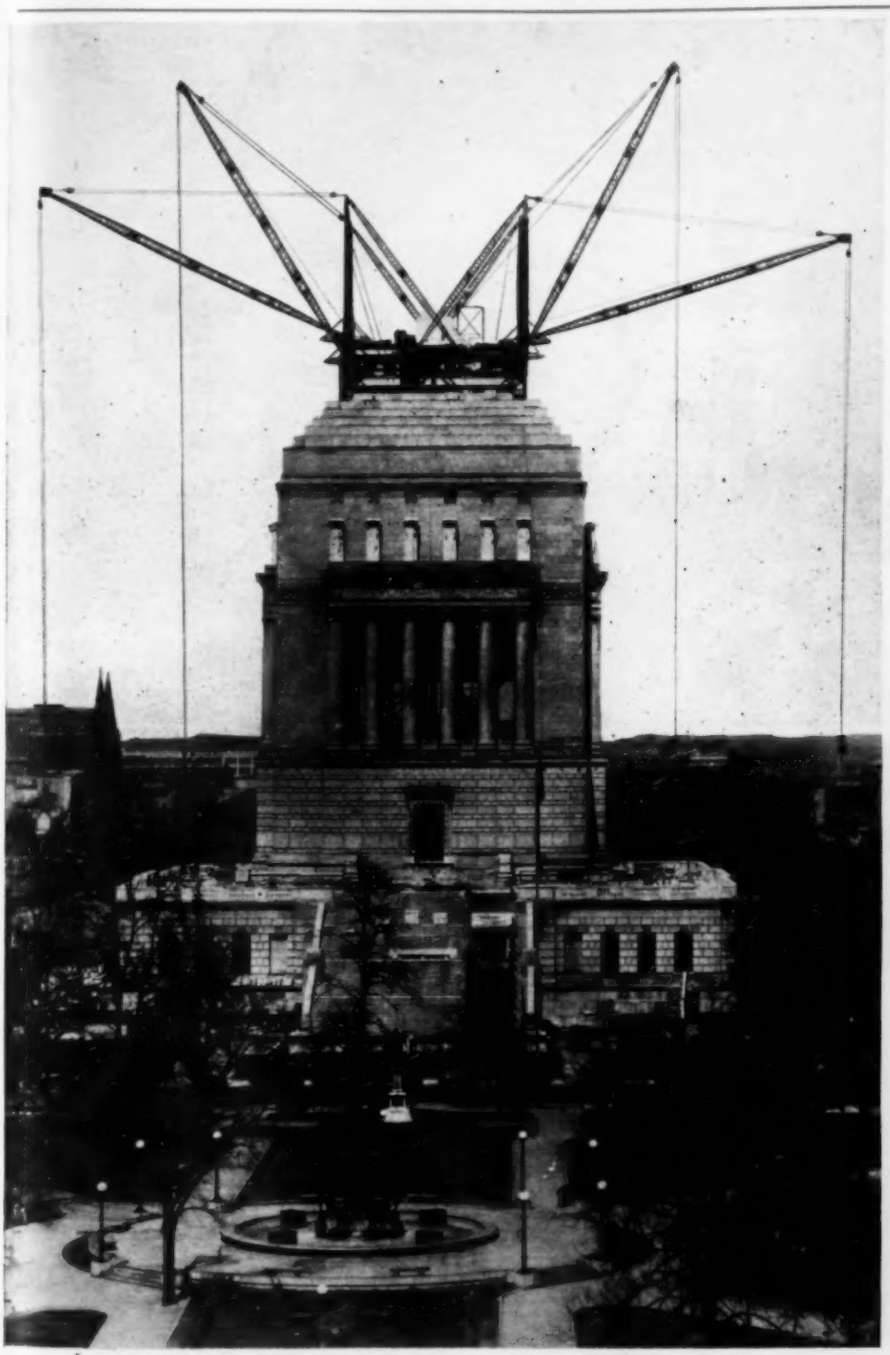


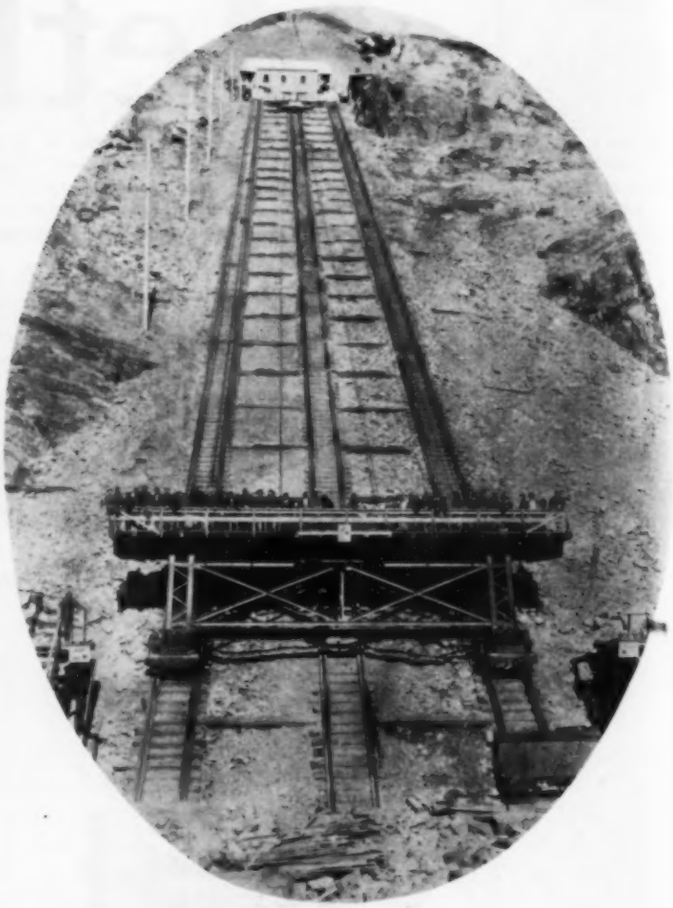
Indiana War Memorial Nears Completion

Work on the Indiana World War Memorial, the 210-ft. masonry shaft at Indianapolis, described in the December, 1927, issue of *Construction Methods*, is entering its final stages, as indicated by the accompanying pictures from A. J. Stanley, rigger foreman for Alexander Howie of Cleveland, contractor for the stone setting. The Hunkin-Conkey Company is general contractor.

This Month's

©Ewing Galloway

570-FT. ABOVE SIDEWALK. *(above)* Tower of 38-story New York Central Building, New York City, for which James Stewart & Co., Inc., were general contractors. McClintic-Marshall Co. erected the steelwork.



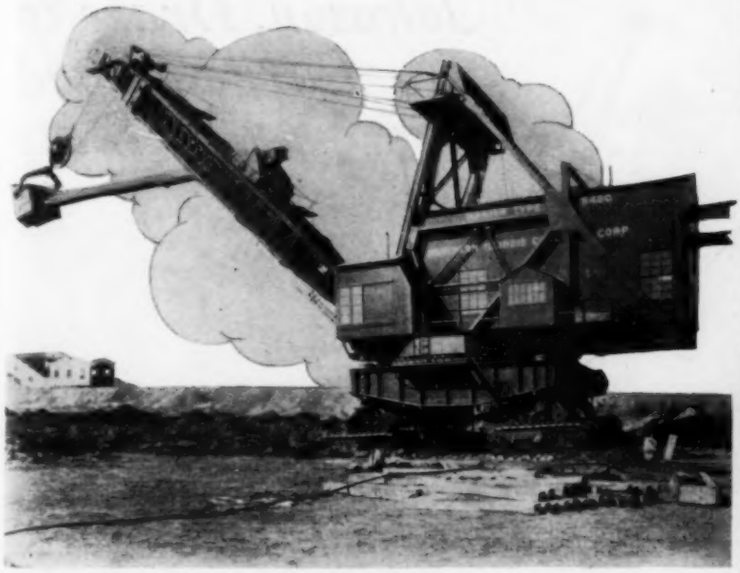
INCLINE, *(above)* 558-ft. long, linking railroad tracks 314 ft. apart vertically, handled box cars, locomotives, steam shovels and construction crew at Diablo dam, which Winston Bros. Co., is building for Seattle, Wash., under direction of W. C. Morse, city engineer, and T. H. Carver, water supply engineer. Hoist speed is 100 ft. per minute and carrying capacity 158,000 lb.

©Wide World

OPEN TO TRAFFIC! *(left)* Governor Alfred E. Smith of New York and A. Harry Moore of New Jersey, on June 20 broke ribbon which placed in service the Outerbridge Crossing, one of the two big interstate highway bridges (see p. 24) across the Arthur Kill, a Port of New York Authority project linking Staten Island, N. Y., and Perth Amboy, N. J.

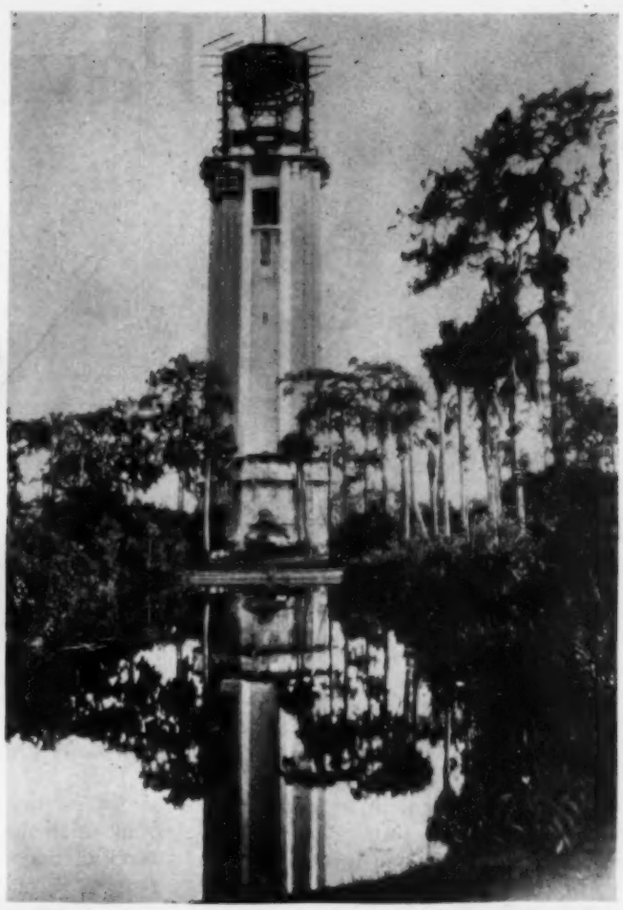
CHAMP CLARK BRIDGE, spanning the Mississippi River between Illinois and Missouri, was formally dedicated and placed in service June 15 as a memorial to Missouri's distinguished statesman. ©Wide World

"News Reel"



LARGEST SHOVEL EVER BUILT, *(above)*. This Marion machine has a 12-cu.yd. dipper, 90 ft. boom, 60-ft. dipper stick and weighs 850 tons. It strips coal for the Northern Illinois Coal Corp. at Wilmington, Ill.

SINGING TOWER *(right)* in the Mountain Lake bird sanctuary, Lake Wales, Fla., beautiful structure erected by Edward Bok of Philadelphia to house carillon of European-made bells.



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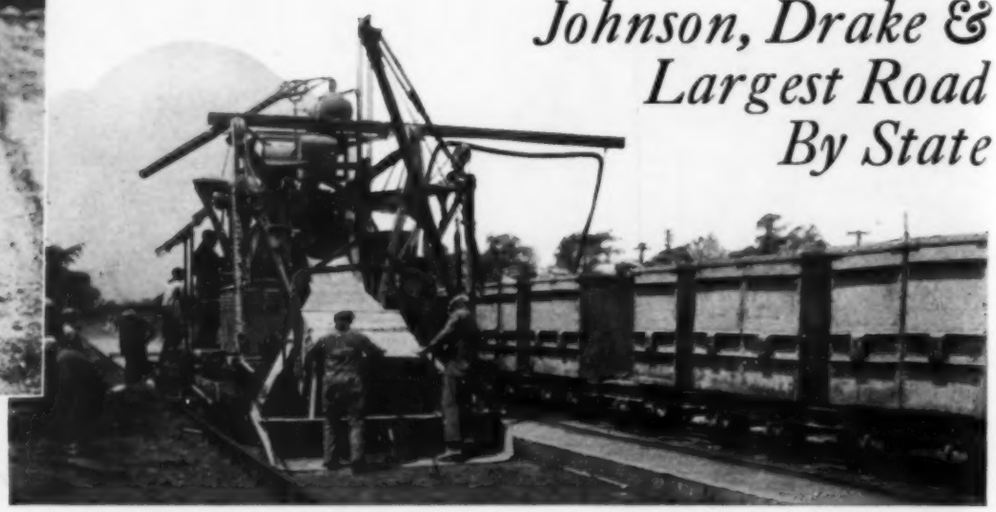
A REAL HOLE. Foundations for huge New Yorker Hotel involve 75,000 cu.yd. of hard rock excavation to maximum depth of about 72½ ft. The George J. Atwell Co., Inc., is handling the job, with George S. Kelley, master mechanic, in charge.

Paving 40-Ft. High-

Johnson, Drake & Largest Road By State

R. P. BAYARD, in charge of the job as vice-president of the contracting company, indicates the slab alignment secured by his form-setters.



DUMPING A BATCH into the charging skip with the aid of the mixer hoist. Note how horizontal timber boom carries water hose line over industrial tracks with ample clearance.

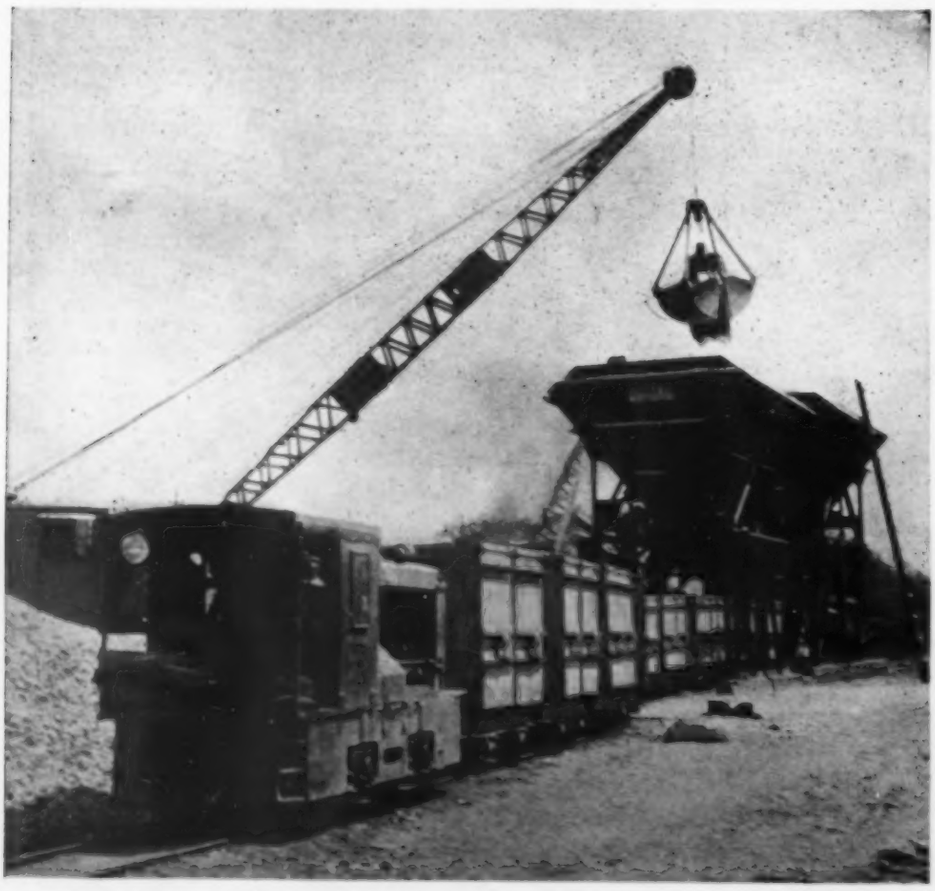
LARGEST single road-building contract ever let by the State of New York, 40 ft. wide and 16 miles long; total cost, $1,400,000; contractors' investment in new equipment, $200,000; four 27-E paving units operating at one time; 400 men on the job; 8,000 sacks of cement used daily; and a specia' chicken dinner for the construction crew every time a new daily progress record is hung up.

These are a few of the high lights in the picture of paving with concrete 9 in. thick the Conduit Boulevard, extending across Nassau County, and passing through no less than 11 towns and villages between Rosedale and Amityville on Long Island, N. Y.

When Johnson, Drake & Piper, Inc., of Minneapolis, secured this contract last year, R. P. Bayard, vice-president of the company, assumed charge of the job and established headquarters at Freeport, the mid-point of the contract.

Job Conditions—The construction plan provided for paving the 40-ft. width of the 16-mile boulevard in four 10-ft. lanes, separated by expansion joints. Among the first important decisions to be made was the selection of the type of plant best suited to the conditions. Sandy soil prevails along the entire route—practically all of it on borrow embankment—a condition which would have made heavy going for motor trucks on the subgrade. The topography is flat and the contractor, therefore, chose an industrial track system for hauling from material plant set-ups to the mixers.

Other important factors in planning and planting the job were: The extremely large quantity of materials re-

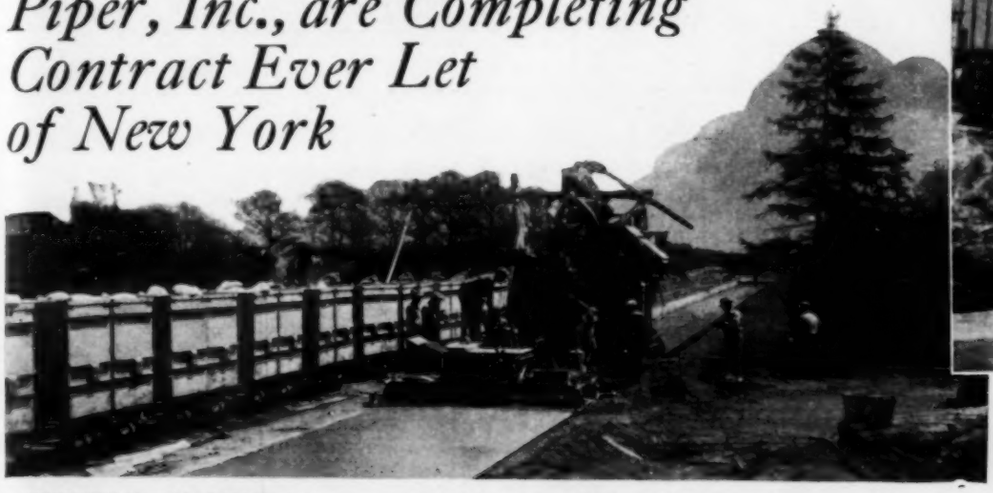


MATERIAL-HANDLING SETUP, with 12-car (24-batch) train, hauled by 8-ton gasoline locomotive, receiving sand and stone from overhead bins fed by crawler cranes and buckets. Each plant serves two paving mixers.

CEMENT LOADING PLATFORM, where sacks, delivered from railroad siding, are speedily dumped on sand

way 16 Miles Long

Piper, Inc., are Completing Contract Ever Let of New York



FINISHING MACHINE follows close behind mixer. Man on batch-box train opens and empties cement sacks on batch to insure speedy charging of mixer.

CHARLEY SANDBERG, chief cook and culinary ace of the contractor's organization who rewards progress records with chicken dinners.

quired for daily delivery—6,000 to 8,000 sacks of cement, 20 carloads of stone, and 420 cu.yd. of sand; heavy automobile traffic along and across the boulevard route; frequent village street intersections and railroad crossings.

Construction Equipment—For each paving unit the main items of plant equipment are as follows:

At Material Handling Plant

2 locomotive cranes (Koehring)
2 clamshell buckets (Owen, 1-yd.)
2 overhead bins (Johnson, with batch-measuring equipment)
Railroad siding (2,000 ft. at largest set-up)
Cement loading platform for 12-car (24 batch) train
Warehouse hand trucks (for handling sacked cement)

Along Route

5 gasoline locomotives (Plymouth, 8-ton)
130 batch boxes (Lakewood)
2 pumps (C. H. & E.) and 2½ in. pipe and rubber hose to deliver water to the mixer and for curing pavement.
65 batch box cars (Koppel)
Industrial track (24-in. gage, Lakewood)

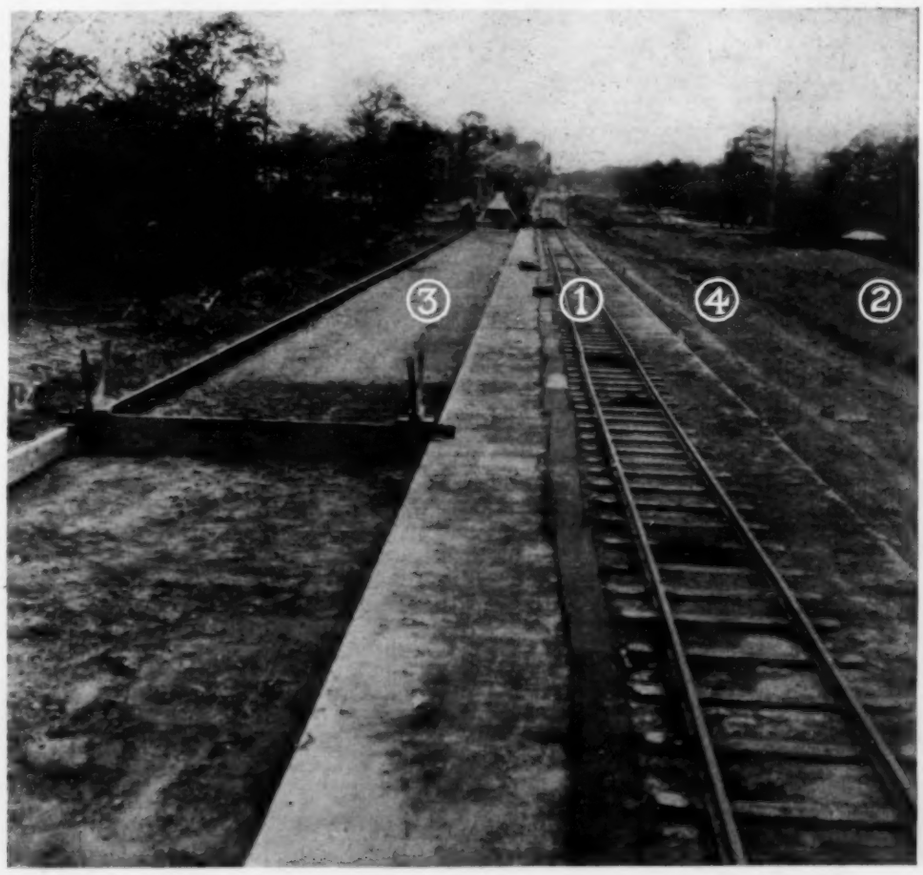
At Mixer

1 paver (Koehring, 27E) with batch box hoist
1 finishing machine (Lakewood)
Steel road forms (4,600 ft., Blaw-Knox)
1 subgrade tractor-grader (McCormick-Deering tractor and H.-P. grader)
1 roller (Austin "Pup," 5-ton)
1 subgrade planer
Burlap and hay for curing concrete

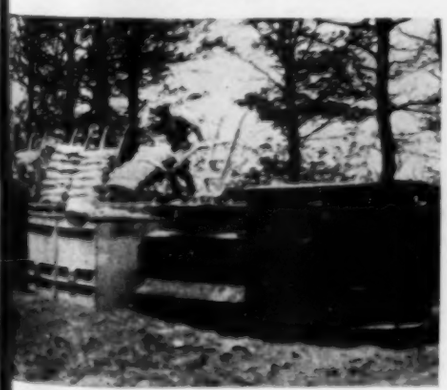
and stone batches with the aid of warehouse hand-trucks of which 72 were purchased for this job.

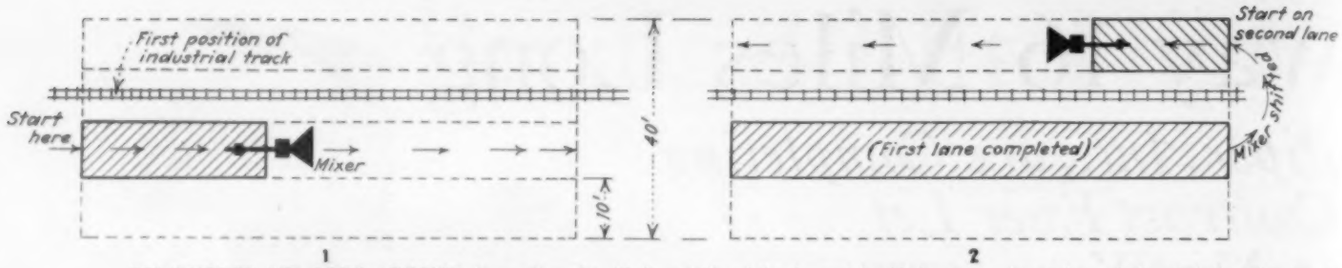
While 7 miles of 24-in. gage industrial track was purchased for locomotive haulage, motor trucks were employed on an extensive scale to supplement and insure against delays of the freight service of the Long Island Railroad in getting crushed stone from the waterfront in Flushing, 14 miles distant, to material-handling set-ups that were inconveniently located with respect to the railroad. Sand was purchased locally in all cases. With work at its height, a fleet of more than 100 motor trucks hauled stone and sand, and 400 men were employed.

Material Plant Set-Ups—There were, in all, five plant set-ups: Two of them each served a 1½-mile section: one (double) a 4½-mile section; one



FOUR-LANE CONSTRUCTION was used to pave the 40-ft. width. Figures indicate sequence of concreting 10-ft. lanes. Expansion joint strips are laid at left of railway track ready for use by mixer crew.





SEQUENCE OF OPERATIONS in paving the 40-ft. width of boulevard in 10 ft. lanes, involving shift of industrial track

(double) a 6-mile section; one (a motor truck set-up) a 3-mile section.

Grading and drainage work started July 15, 1927, and paving was begun Aug. 10. When operations got into full swing the contractor operated four complete 27-E paving units at one time. The job, at this writing, is in its final stages, with two paving units and 180 men at work on the paving and 100 men following up with shoulder trimming and general cleanup.

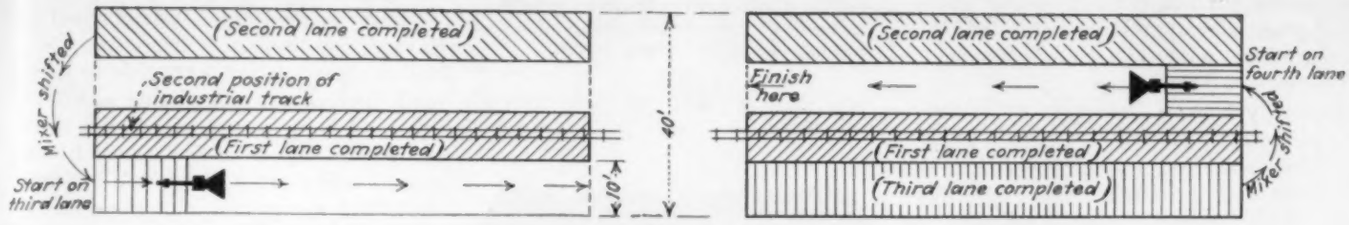
For paving the 40-ft. width in 10-ft. lanes, the sequence of operations and the route of the mixer, on its four

FINE GRADING (*above*) with the aid of a steel-shod scraper hauled by a tractor-grader.

COMPACTING THE SUBGRADE (*left*) with a 5-ton gasoline road-roller.

TEMPLET with ends on steel road forms guides filling or leveling off to bring subgrade to specified elevation before concreting.

SETTING THE FORMS with the help of a spirit level and wood templet. For this contract the contractor purchased 16,000 lin.ft. of forms.



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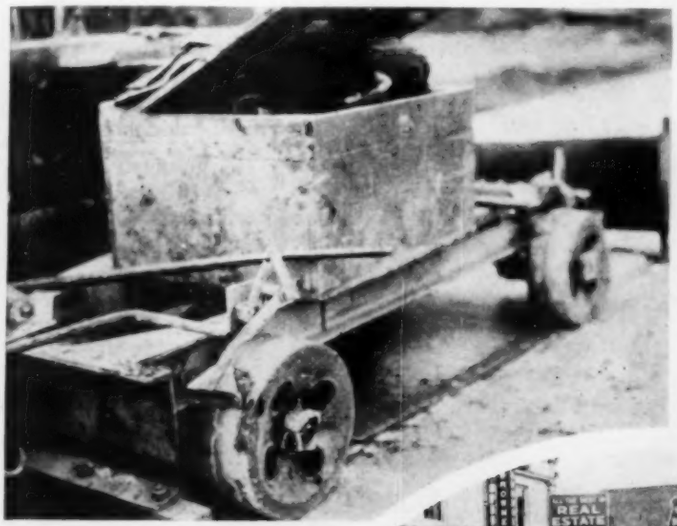
to finished slab after two lanes have been concreted. Mixer makes four trips up and down each section of the Conduit Boulevard.

trips up and down each section, is indicated in the diagram at the top of pages 8 and 9. The concrete slabs, of 1: 2: 3½ mix, are flat, 9 in. thick, and are reinforced with built-up mats of steel rods. Longitudinal joints between the 10-ft. lanes are ½ in. wide, and transverse joints (every 78 ft.) are ¾ in. wide, formed by premolded strips of Carey asphalt-saturated felt.

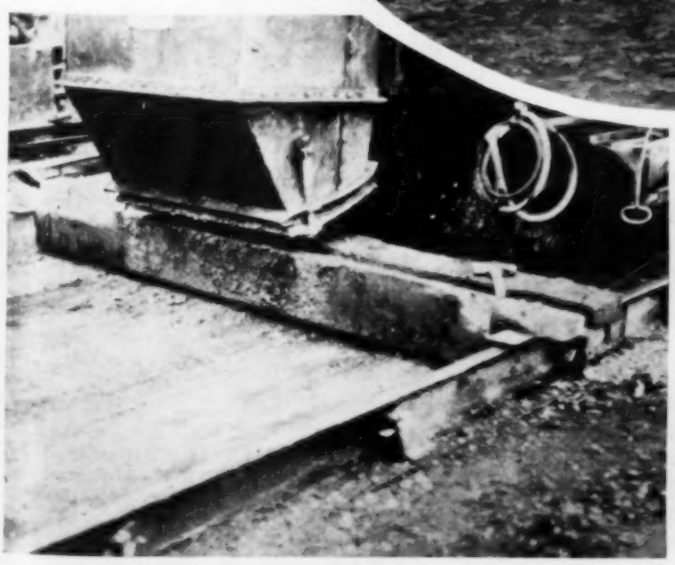
Subgrade Operations — The subgrade is brought to elevation by a one-man tractor-powered blade grader hauling a steel-edged planer with its ends running along the tops of the steel



FLAT-TREAD WHEELS (*above*) were substituted for flanged wheels when finishing machine rode on completed slab, instead of on road forms.

STREET INTERSECTIONS (*in oval*) in the eleven villages traversed by the Conduit Boulevard required individual concreting plants and special construction.

SLOTTED RACK (*above*) 13½ ft. long and 10 ft. wide, simplified the work of fabricating the steel reinforcement into mats.



TRANSVERSE PLANKS with ends riding on the forms, smoothed subgrade and served as bulkheads to prevent concrete flowing under mixer.

REINFORCING STEEL was quickly placed in the form of built-up mats held together by clips at intersections and distributed along roadside.

road forms. A 5-ton road roller compacts the surface prior to concreting. Subgrade elevation is checked, before concreting, with a toothed templet. The weight of the green concrete on the sandy Long Island soil, according to disclosures of core-borings through finished sections of the paving, often compacts the subgrade to an elevation slightly below that required for a slab thickness of 9 in. Under these conditions the contractor maintains that he must actually deposit more than the specified 9 in. of concrete to bring the surface of the finished slab to grade.

Haulage—Measured batches of aggregate hauled by 8-ton industrial locomotives are picked off the cars by a hoist on the paving mixer and dumped direct into the charging skip. Cement in sacks is dumped on top of each batch at the loading plant, and the bags are opened up and emptied on the batch while the train makes its trip to the mixer, thus saving time in the charging operation. On the mixer a horizontal wooden boom, as shown in one of the photographs, carries the water hose line over the narrow gage track, allowing trains ample clearance.

INDUSTRIAL TRACK (*below*) in 15-ft., 24-in. gage, built-up sections, carried batches from material plants to mixers. Switch and siding allows passing of full and empty trains.

CURING of the concrete slab was done by (*left*) placing and sprinkling burlap strips for one day and then replacing them with hay (*right*) which was kept moist for 18 days.

Finishing—Finishing is done with a mechanical tamper and screed following close behind the mixer. The scheme of concreting the 40-ft. boulevard with its 10-ft. lanes necessitated changing the flanged wheels on the finishing machine to flat-tread wheels when the latter were required to ride on the edges of finished paving slabs, instead of on the road forms.

The contractor is curing his concrete by placing two burlap strips on the completed work, keeping them moistened for one day, and then removing and replacing them by hay, watered twice a day for 18 days. The item of hay alone cost $16,000.

Progress—Paving progress on the 10-ft. lanes has been going ahead steadily at the rate of about 1,000 ft. a day per mixer, although as much as 1,700 ft. has been concreted in a single day. Each paving unit is equipped with 4,600 ft. of steel forms, or enough to set forms for 2,300 ft. of roadway.

Housing and Food—The 150 skilled men who form the backbone of the Johnson, Drake & Piper force on this contract are housed and fed in Freeport, where a large three-story brick building was rented and provided with office, dining room and dormitory facilities. Under the skillful ministrations of Charley Sandberg, chief cook and culinary ace of the contractor's organization, the men are well fed. Two features of the commissary service are the provision of hot lunches sent out by motor truck to the men on the job every day, and a special chicken dinner every time a daily progress record is broken.

"Last season," said Vice-President Bayard, in discussing the work, "we had an open fall and were able to pave until December, completing 230,000 sq.yd. of 9-in. pavement, of the total of 375,000 sq.yd. in the contract. A special night train delivered cement, steel, and expansion joint material to all points on the job, and crushed stone to two delivery points, supplementing stone deliveries by motor truck. We used a total of 16,000 ft. of heavy 9-in. steel forms on this contract, and found that the parallel lane method of construction with the longitudinal joints showing up prominently in the completed work, requires much better forms and form-setters than pavement constructed in one width, where only the edges are noticeable, and they are often covered with shoulder material."

Personnel—In charge of various operations under Mr. Bayard are the following superintendents: A. J. Uren and Leonard Dickson, paving mixers; L. J. Coty, plant; J. Feller, village street intersections; W. J. Dewall, earth shoulders; L. B. Day, trucking. S. Zipoy is office manager.

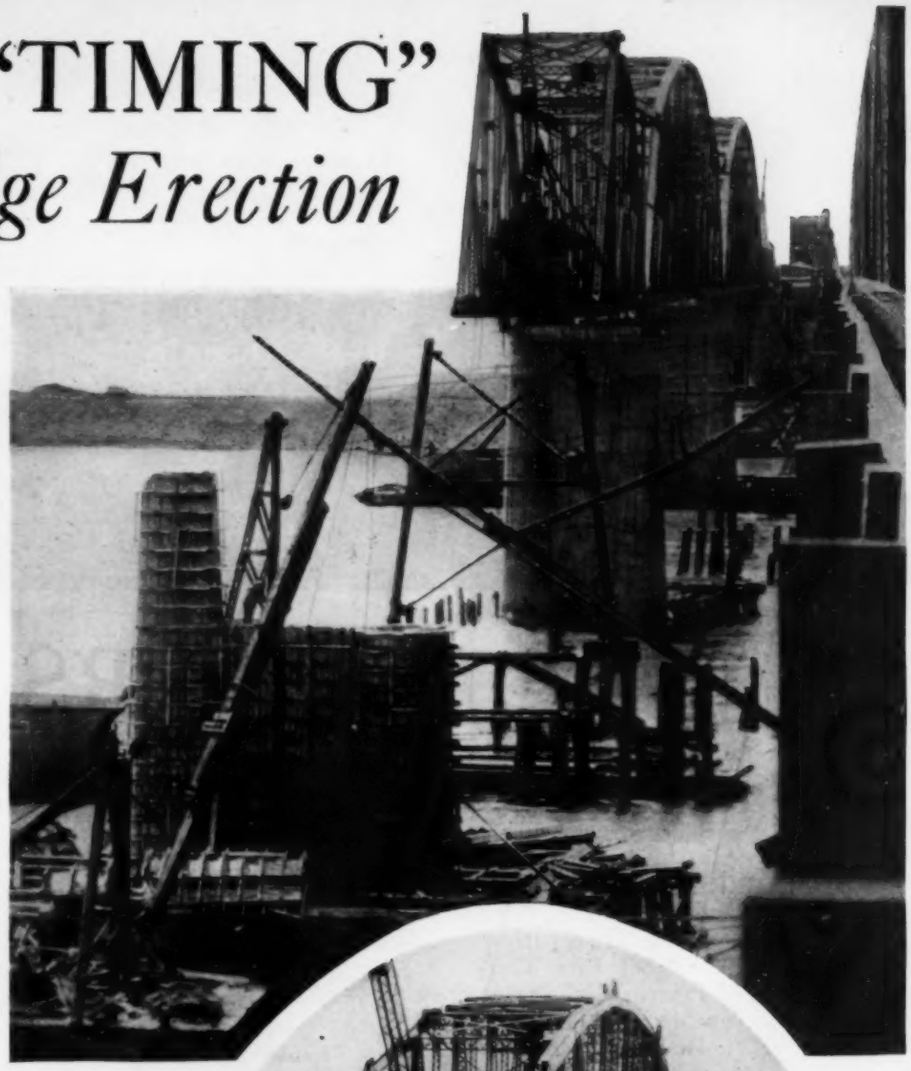
For the State of New York Arthur W. Brandt is Commissioner of Highways; J. S. Bixby, division engineer; J. J. Darcy, resident engineer, and J. A. Flinn, engineer in charge of this project. Under Mr. Flinn are Inspectors Finkelstein, Chargin, Rooney and Roach.

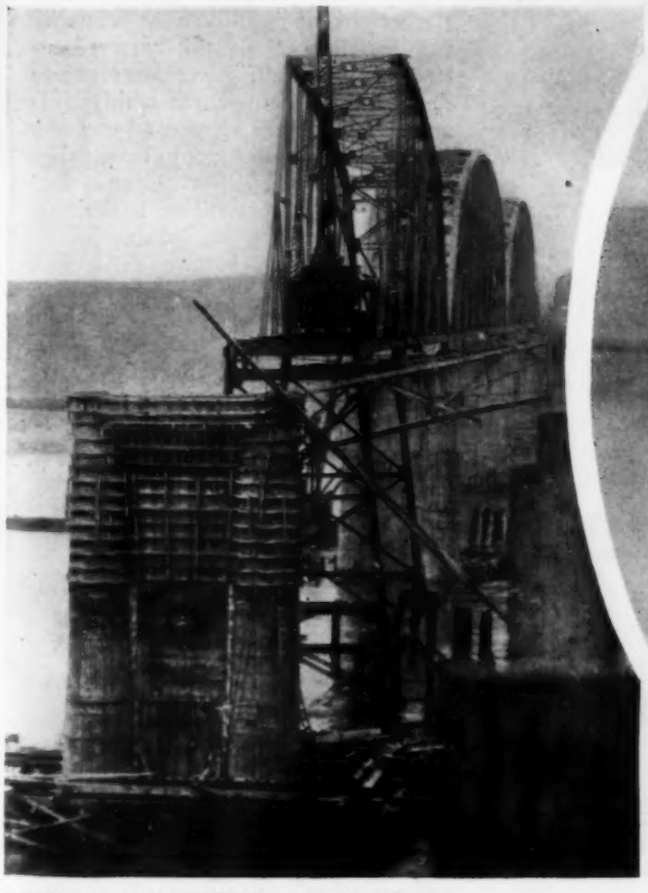
THIS MONTH: The Arthur Kill Bridges, two large steel structures, with long approaches on high concrete piers, linking Staten Island, N. Y., and New Jersey—a Port of New York Authority project, completed and dedicated last month. **See p. 24.**

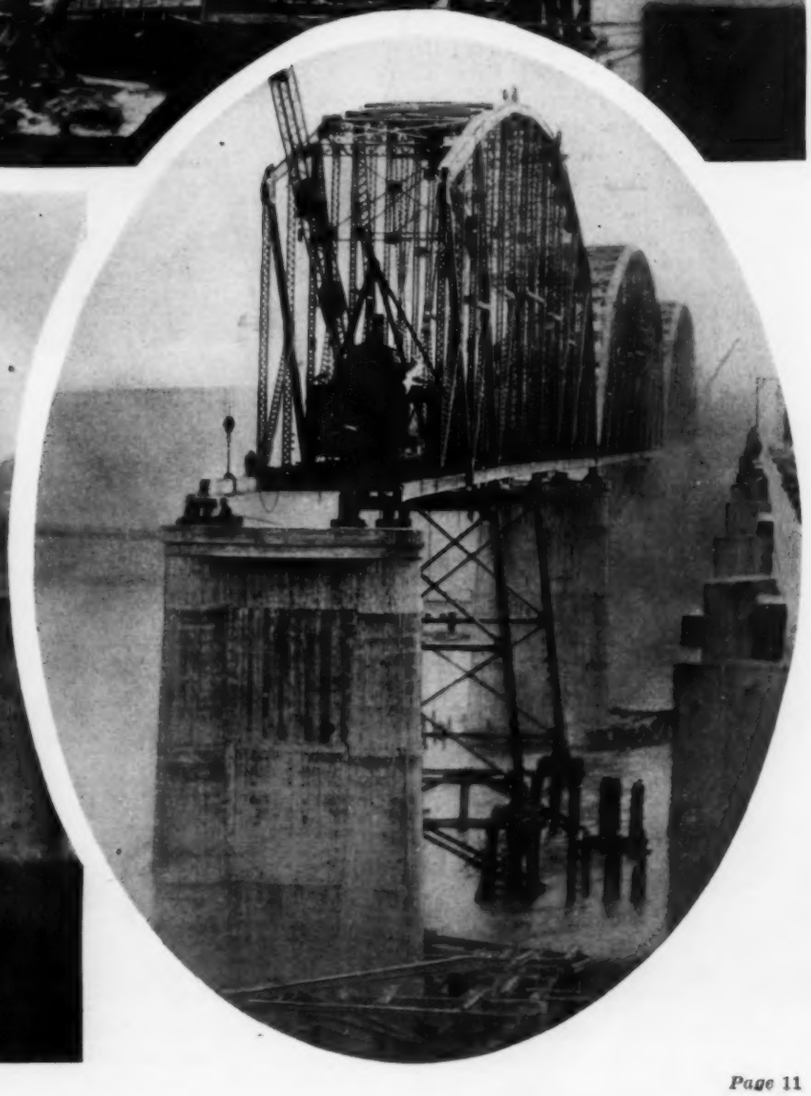
PROPER "TIMING" *Speeds Bridge Erection*

CORRECT timing of different operations on the same structure enabled the Kansas City Bridge Company to speed up the building of the Alton-St. Louis highway toll bridge across the Missouri River at Fort Bellefontaine, Mo. The three photographs herewith, taken within a period of three weeks, illustrate how the work of building the concrete piers and erecting the steel work was coördinated so that both operations could be carried on simultaneously.

The structure consists of four duplicate 440-ft. spans with 20-ft. concrete roadway. The piers (*upper right*) were constructed by the open crib and cofferdam method. The steel spans were redesigned in the office of the contractor who handled both the substructure and the superstructure to permit of partial cantilever erection involving only two points of support between piers *(lower left)*. This method eliminated the hazard of a large quantity of falsework. As the steel cantilever spans are erected the piers are finished in time *(lower right)* to support them.







CONCRETE LOCK is 600 ft. long, 110 ft. wide and has a lift of 16 ft.

BELT CONVEYORS

Place Concrete for Lock and Dam

IN DELIVERING concrete from cars to forms at the Starved Rock lock and dam on the Illinois River near Ottawa, Ill., Woods Bros. Construction Co., of Lincoln, Neb., made use of a specially designed belt conveyor rig 77 ft. long, mounted on a steel hoisting truck equipped with industrial car wheels for movement on rails along the job. A track was laid on the berm parallel to the forms so that the conveyor unit could be moved readily to and fro. A winch, mounted on the framework, controlled the raising or lowering of the conveyor to the desired elevation for delivery of concrete.

Special Conveyor—Following a design suggested by the contractor, the Northern Conveyor Co., which supplied the special equipment, suspended the conveyor frame by cables from the truck frame and counterbalanced it so that it could be carried in a horizontal position, while being moved along the track, without end supports. Power for moving the rig was supplied by a winch on the frame with a chain drive to the axle of the wheeled truck.

GEORGE K. LEONARD, general superintendent for Woods Bros. Construction Co.

In addition, another conveyor, a Barber-Greene unit, intended primarily for handling earth fill, was reconstructed for handling wet concrete into the forms by equipping it with wheels and a wooden bent support on one end.

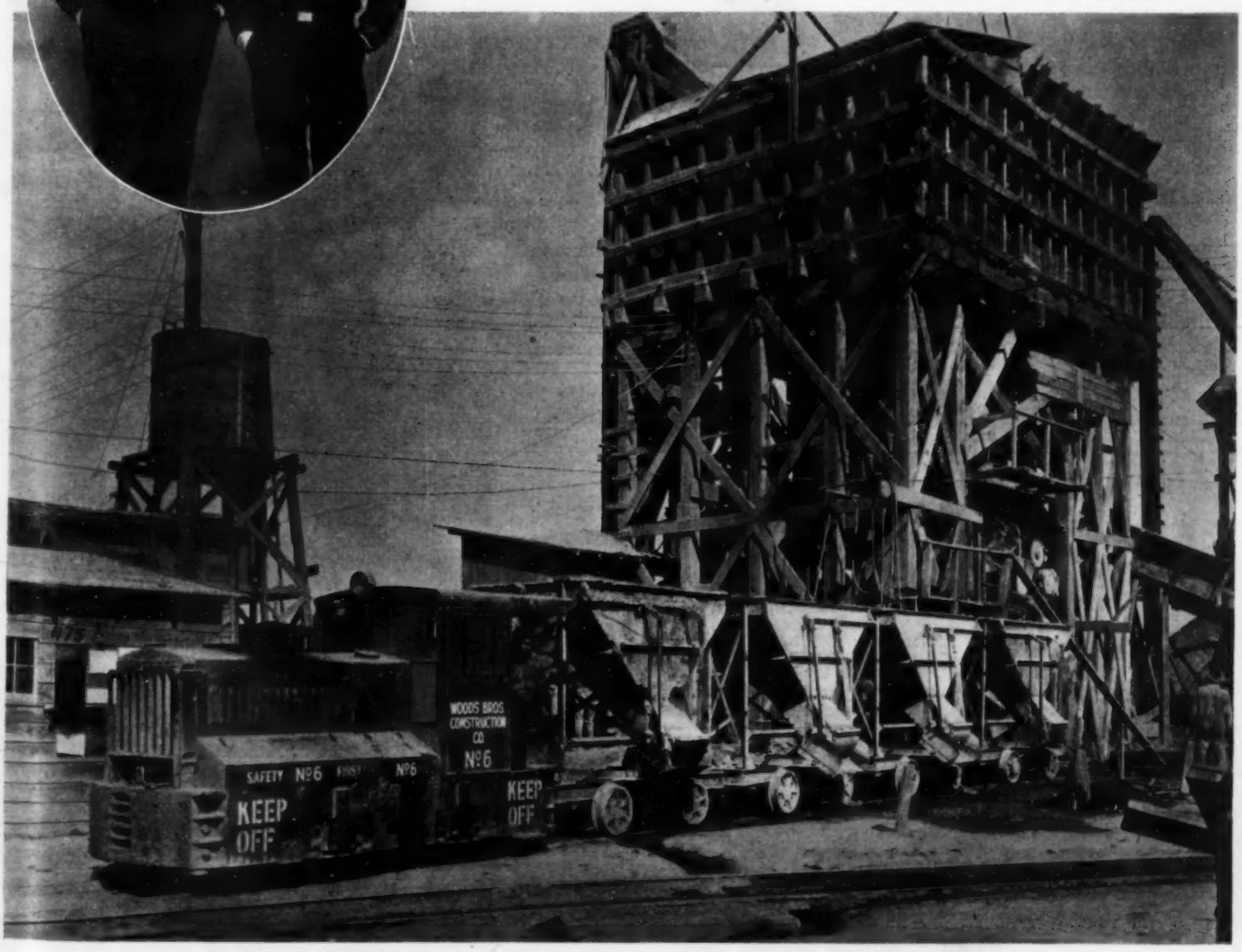
The Starved Rock project comprises the construction, within a large cofferdam, of the lower unit of a chain of five locks being built by the Illinois Division of Waterways. The lock dimensions are 110 ft. wide and 600 ft. long, with a lift of 16 ft. The dam

SPECIAL BELT CONVEYOR, on wheel-mounted frame, has 77-ft. reach for delivering concrete into forms.

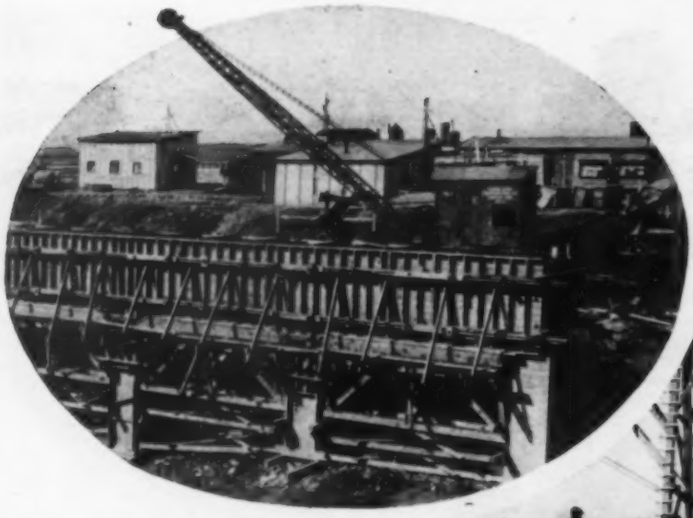
MOVING STEEL FORMS, assembled in unit weighing 130 tons, across lock for concreting opposite wall.

S. VAN PELT *(left)* superintendent of construction, and C. M. COFF *(right)* engineer of construction for the contractor.

embodies a power house headgate structure 520 ft. long on 30 concrete piers spaced 14 ft. apart, an ice chute with a lift sector gate, and a spillway 680 ft. long extending across the river and divided into ten 60-ft. sections



CENTRAL MIXING PLANT, with elevated bins over 1-yd. mixer, discharges by gravity into 2-yd. concrete cars hauled by 8-ton gasoline locomotive.



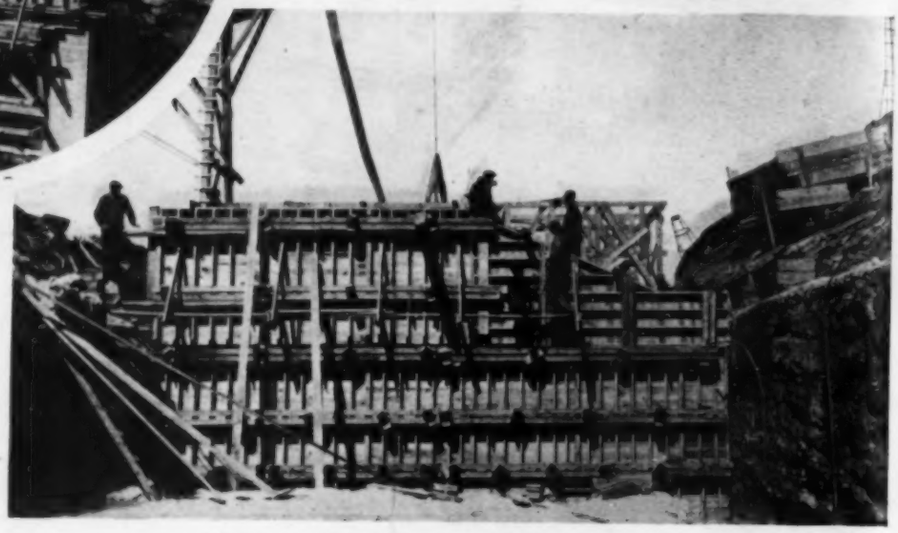
POURING upper approach slab *(left)* with Brownhoist crane and ¾-yd. bucket.

progressing rapidly on the dam proper.

For Wood Bros. Construction Co., Wayne Prindle, with headquarters at Lincoln, Neb., is chief engineer. In immediate charge of the project are George K. Leonard, general superintendent, C. M. Coff, engineer and S. Van Pelt, superintendent.

For the Illinois Division of Waterways William F. Mulvihill is supervisor of construction, M. G. Barnes, chief engineer and L. D. Cornish, acting chief engineer.

The excavation for the Starved Rock project was handled by Wilson & Company, engineers and contractors of Ottawa, Ill.



FORMS for bulkhead in headgate footing structure.

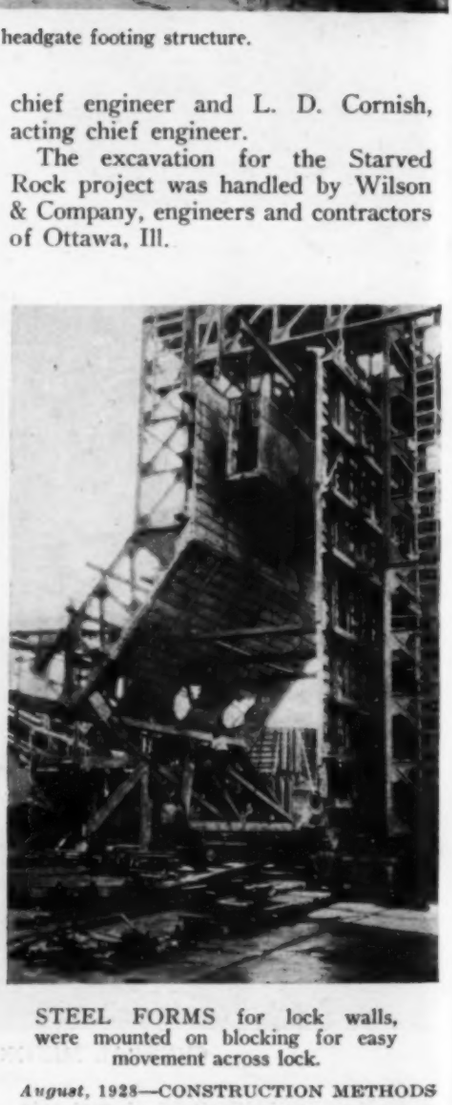
with concrete piers 8 ft. wide intervening.

Concrete Plant—For mixing concrete, the contractor set up a central plant with two bins for gravel and bulk cement, elevated 18 ft. above ground on wooden bents to feed, by gravity, a 1-yd. Chain Belt mixer directly underneath them. The mixer, 9 ft. above ground, discharged into 2-yd. Lakewood concrete cars which 8-ton Plymouth locomotives hauled over industrial track to a point of delivery on the belt conveyor rig, previously mentioned, which fed the forms. At the central plant set-up, another conveyor handled bulk cement delivered by railway cars. A stiff-leg derrick and clamshell bucket unloaded gravel from cars and fed the overhead bin above the mixer.

Forms—In constructing the locks, the contractor employed Blaw-Knox steel forms for the standard sections and wooden forms for irregular sections. Two units of steel traveling forms were in service. After the river wall had been completed, the steel forms were moved across the locks, completely assembled, and set up for the pouring of the concrete in the land wall. Each form unit was mounted on specially constructed blocking placed on rollers. In employing this method of moving the contractor made a substantial saving in the cost of form erection.

Pouring of the concrete on this project started March 16, 1927, and at the present time the lock and headgate sections have been finished and work is

BELT CONVEYOR, originally used for earth fill, was converted to handle wet concrete and travel alongside forms.



STEEL FORMS for lock walls, were mounted on blocking for easy movement across lock.

FORMS IN PLACE for concreting the upper section of the sloping retaining wall flanking the Liberty bridge approach.

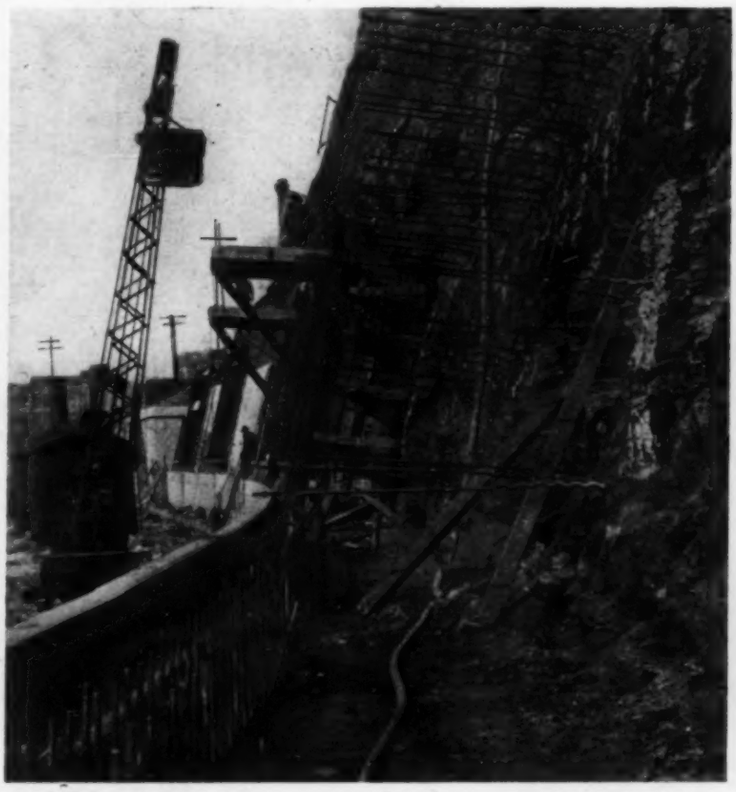
HUGE WALL *Anchored to Slope*

UNUSUAL design and construction features were involved in the huge retaining wall of concrete, 85 ft. high and 3 ft. thick, which Booth & Flinn, Ltd., of Pittsburgh, have built for the Allegheny County Commissioners to protect the approach to the Liberty bridge at Pittsburgh, between Forbes St. and the Boulevard of the Allies. The new roadway is cut as a shelf along the side of a slope having a sheer drop of 115 ft.

The job required 186,000 cu.yd. of excavation and 10,000 cu.yd. of concrete masonry in retaining walls on both the uphill and downhill sides of the slope. The uphill sloping surface was faced with a concrete wall 36 in. thick, built on a ¼:1 slope. The base course of this wall was designed by the Department of Public Works to withstand the total thrust of the entire wall and the material above, but as an additional precaution against slipping the wall was anchored to its sloping bed by steel bars placed on 4-ft. centers. If a vertical wall had been substituted for this sloping wall, it would have been 85 ft. high and would have called for a base 65 ft. thick.

Drainage System—To prevent danger and damage due to seepage water back of the wall three horizontal lines of open-jointed terra cotta pipe were entrenched along the hillside. These terra cotta pipes empty into steel pipes laid up and down the slope to drain into an exposed gutter along the bottom of the wall. The openings of these drainage pipes are exposed and arranged so that they can be cleared should any stoppage occur in them. In addition, weep holes penetrate the masonry wall at frequent spacings.

The slope wall contains approximately 3,800 cu.yd. of masonry. Above the slope wall, 6 ft. back from its top, rises a vertical concrete wall to withhold the top layer of soil; this vertical wall reaches a maximum height of 12 ft. and is 72 in. thick at the bottom and 18 in. thick at top. Between the base of this upper wall and the top of the slope wall is a concrete gutter to prevent water draining back of the slope wall or overflowing the surface and staining it.



STEEL BARS, on 4-ft. centers, anchored the wall to its sloping bed.

COMING: A pictorial article covering in detail the construction of the Conowingo dam and power house on the Susquehanna River in Maryland—an outstanding job in the field of water power development.

Step-by-Step

Using a Trench Excavator

1 WHEN ALBIN CARLSON, curb and gutter contractor of Chicago, tackles a job he makes definite plans for handling the three major operations involved: (1) Excavation; (2) form setting; (3) concreting. For his first operation he starts one of his Barber-Greene curb and gutter ditchers down the grade line.

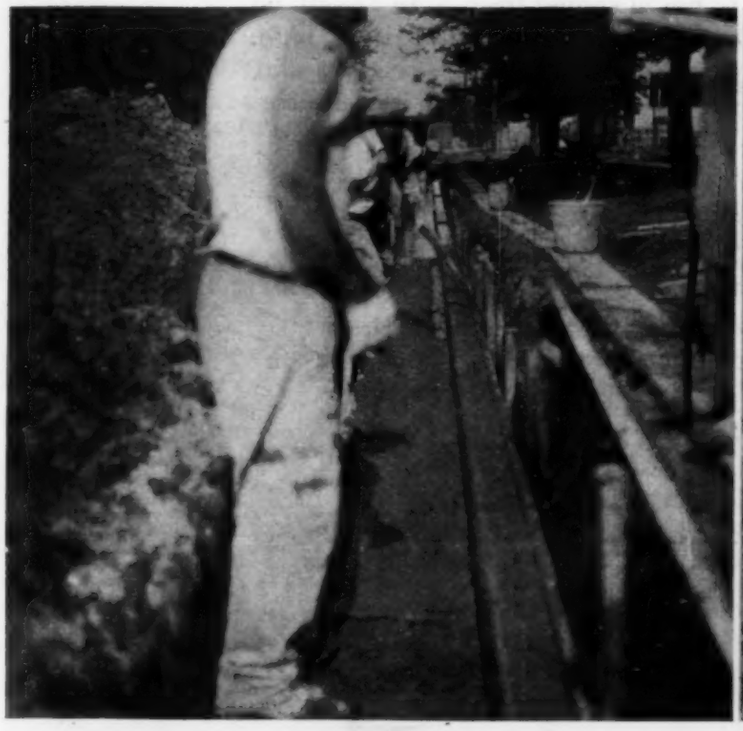
2 WITH MODERN EQUIPMENT and an experienced operator, he is able to make the cut to the exact width and depth called for by the engineer's specifications.

3 AFTER THE TRENCH has been squarely cut and the spoil piled alongside for backfilling later, the next operation consists of—

Field Methods
For Curb and Gutter Work

4 SETTING THE FORMS accurately to line and grade and bracing them to insure proper alignment.

5 WITH THE FORMS in place and properly lined up, the contractor is ready for the final operation of pouring concrete.



6 AFTER THE FORMS have been filled, workmen bring the surface to a smooth finish.

7 THE JOB IS COMPLETED with curb and gutter cast integrally. All that remains to be done is to remove the form braces and backfill behind the curb line.

TWO new Byers catalogs for YOU

BEFORE you make any move to buy a shovel, from ⅝ to 1¼ cu. yd. capacity, you should have one of these new catalogs, or both. You will learn why the Master Gas Shovels, 1 and 1¼ cu. yd. and the Revolving Bear Cat, ⅝ cu. yd., have gained such a remarkable reputation for speed and power.

Direct drive, fast independent rope crowd, patented shock absorber for cables, ruggedness and extreme simplicity are features of these shovels which you will find illustrated and explained in these new catalogs.

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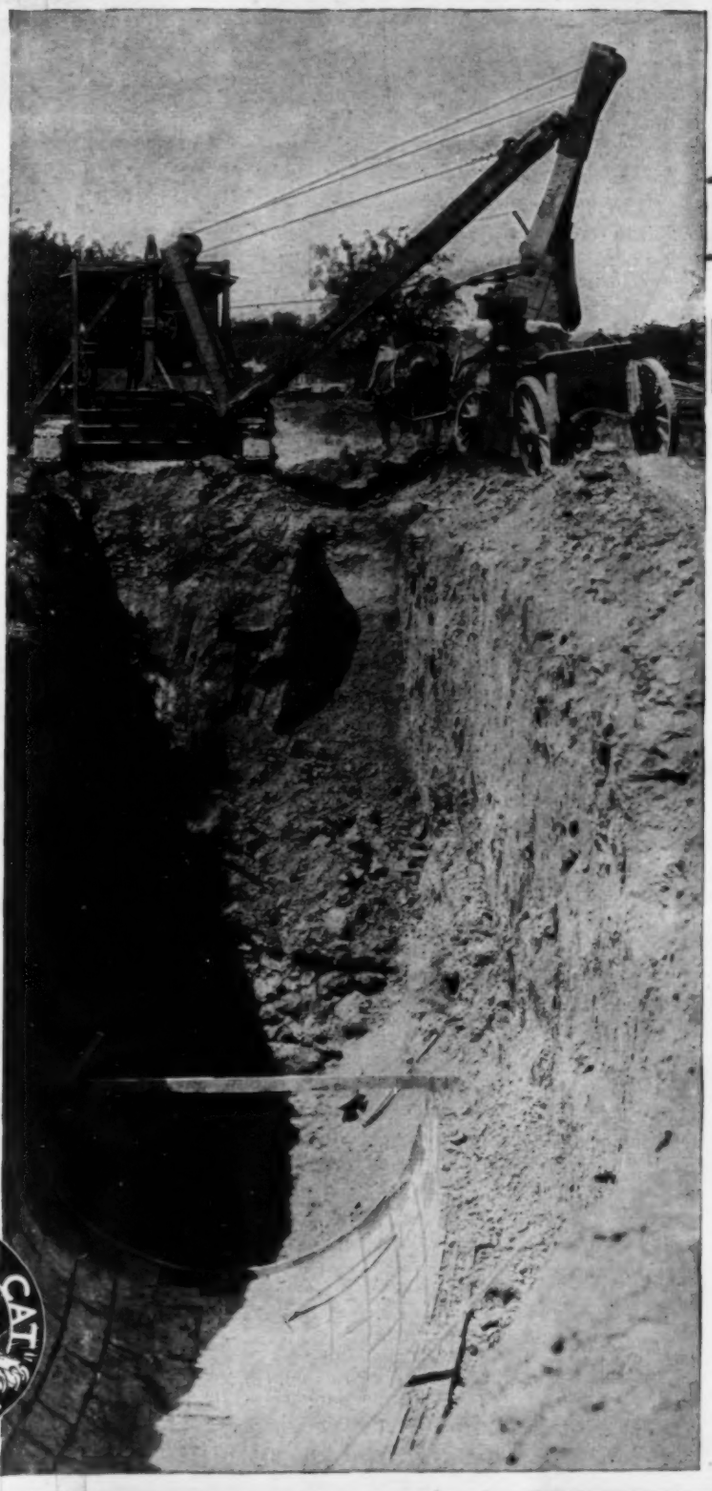
VALUE-Plus!

Second Bear Cat purchased by McCoy Construction Co., Emporia, Kansas, digging 1 mile sewer, 17 ft. deep, 10 ft. wide.



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the 1928 BEAR CAT

IN the new model Bear Cat at the new price, you get more value, i. e. more machine and more performance per dollar invested, than in any other machine available.

For digging trenches to a depth of 16 feet with the Ditcher, grading shallow cuts with the Skimmer, or handling loose materials with the Clamshell—anything that can be done with a half-circle machine—the Bear Cat is supreme.

A large proportion of jobs can be done most economically and profitably with this type of outfit, and it is for these jobs that we shall continue to build and recommend the Bear Cat.

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BYERS BEAR CAT

THE ALL-PURPOSE ONE-MAN CRANE-SHOVEL

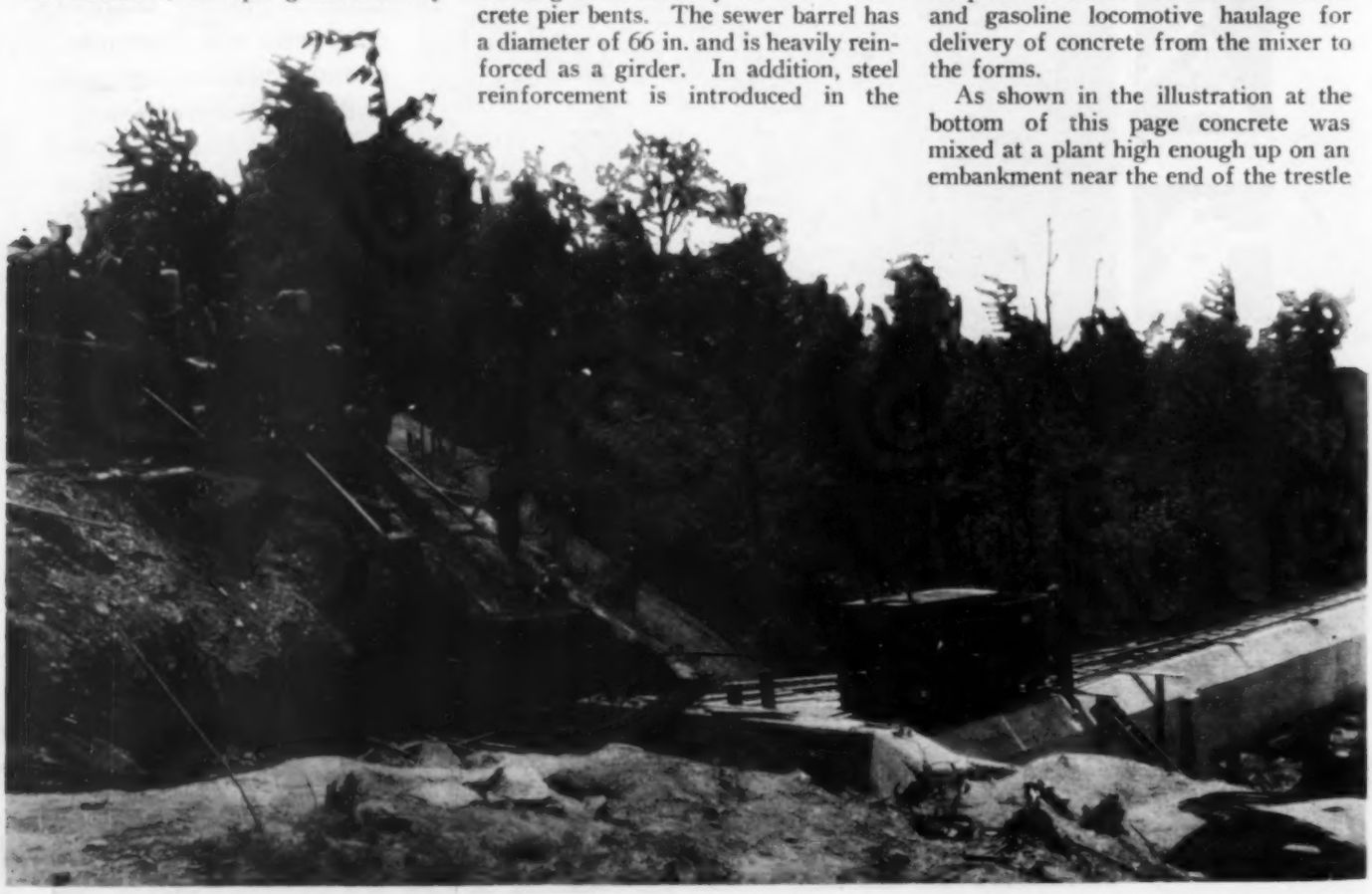
HOW THE WOODEN FORMS were set and braced. Gasoline locomotive and concrete batch-box car traveled on top of forms.

Sewer Crosses Flats on Concrete Trestle of 47 Spans

AS PART of the project for providing Springfield, Ill., with two intercepting sewers, one on each side of the city and aggregating 20 miles in length, as described in the December (1926) issue of *Construction Methods*, the Springfield Sanitary District has built a long reinforced concrete trestle structure to carry the line across the flats of Spring Creek. This portion of the interceptor comprises 47 spans, each 45 ft. long, and is carried at an average height of 7 ft. above ground level by means of concrete pier bents. The sewer barrel has a diameter of 66 in. and is heavily reinforced as a girder. In addition, steel reinforcement is introduced in the form of hoops so placed as to resist flattening effect.

Under the direction of Wesley B. Walraven, district engineer for the Springfield Sanitary District, Floyd Shofner, contractor of Atchison, Kan., adopted the method of industrial track and gasoline locomotive haulage for delivery of concrete from the mixer to the forms.

As shown in the illustration at the bottom of this page concrete was mixed at a plant high enough up on an embankment near the end of the trestle



INCLINED CHUTE delivered concrete from mixer to batch-box car

so that a batch could be discharged by means of an inclined chute directly into cars hauled to the forms by gasoline locomotive. The narrow-gage track was extended from the mixer plant over the sewer trestle structure, being carried either on top of the section of sewer already concreted or on top of the wooden forms erected for the next section. This plant layout simplified the operation of transporting and discharging the concrete to place. The gasoline locomotive pushed rather than pulled the cars of mixed batches to the point where concreting was in progress.

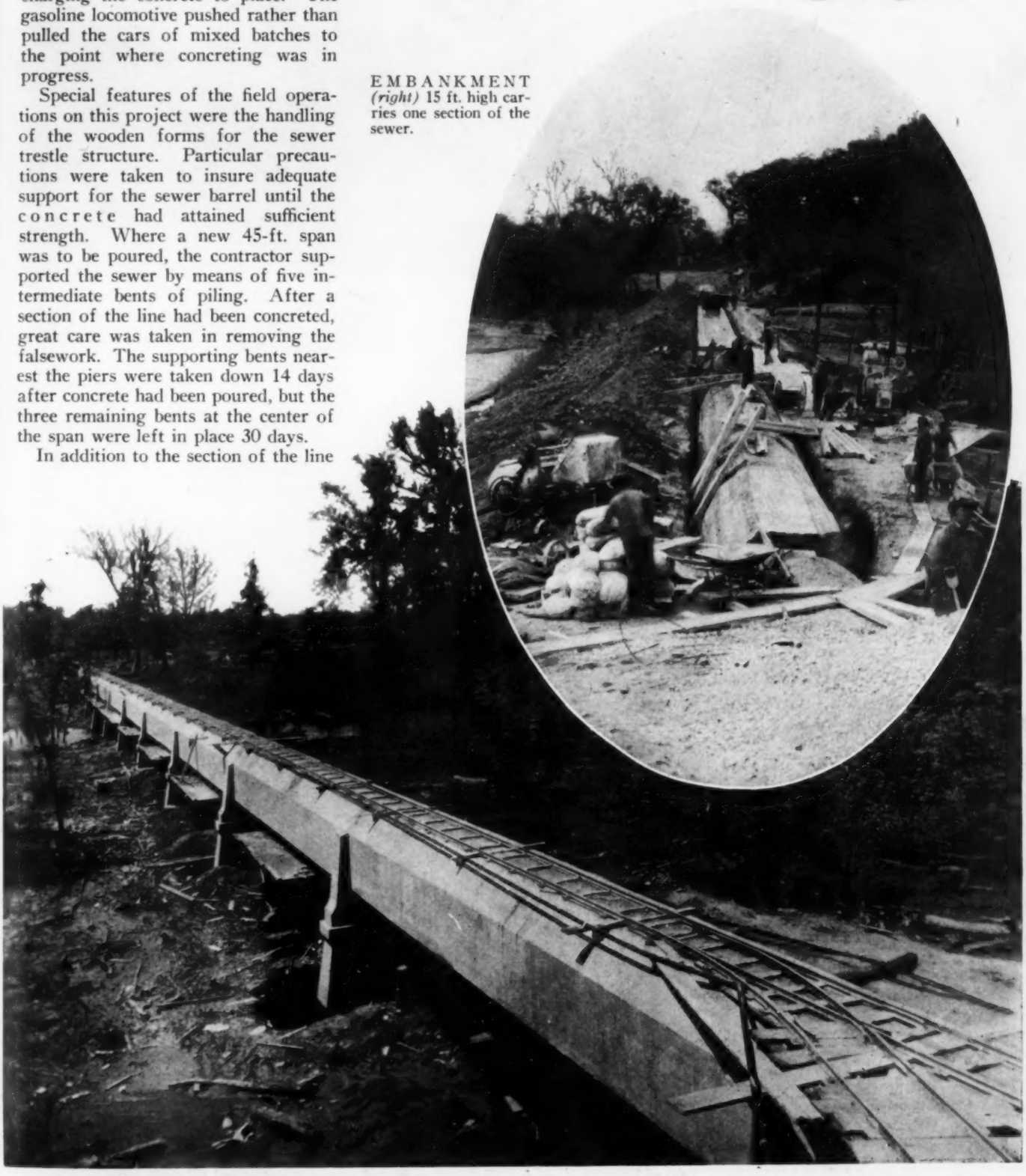
Special features of the field operations on this project were the handling of the wooden forms for the sewer trestle structure. Particular precautions were taken to insure adequate support for the sewer barrel until the concrete had attained sufficient strength. Where a new 45-ft. span was to be poured, the contractor supported the sewer by means of five intermediate bents of piling. After a section of the line had been concreted, great care was taken in removing the falsework. The supporting bents nearest the piers were taken down 14 days after concrete had been poured, but the three remaining bents at the center of the span were left in place 30 days.

In addition to the section of the line on the trestle structure, one section of the 56-in. monolithic sewer was supported by a sill approximately 15 ft. in height, as shown in the photograph in the oval on this page. The embankment was so well compacted that the sides of the sewer trench remained vertical while construction was in progress.

For the Springfield Sanitary District, Wesley B. Walraven and William E. Dawson were district engineers. The consulting engineers were Pearse, Greeley & Hansen, of Chicago.

COMING: "A Dozen Ways of Getting Concrete from the Mixer to the Forms," illustrating plant set-ups and equipment used by a number of contractors on a variety of engineering structures. There may be a suggestion in this picture story that you can apply to your own work.

EMBANKMENT *(right)* 15 ft. high carries one section of the sewer.



TRESTLE STRUCTURE consists of 47 spans, each 45 ft. long. Industrial track is laid on top of structure.

Getting Down to DETAILS

[Close-up Shots of Job Methods and Equipment]

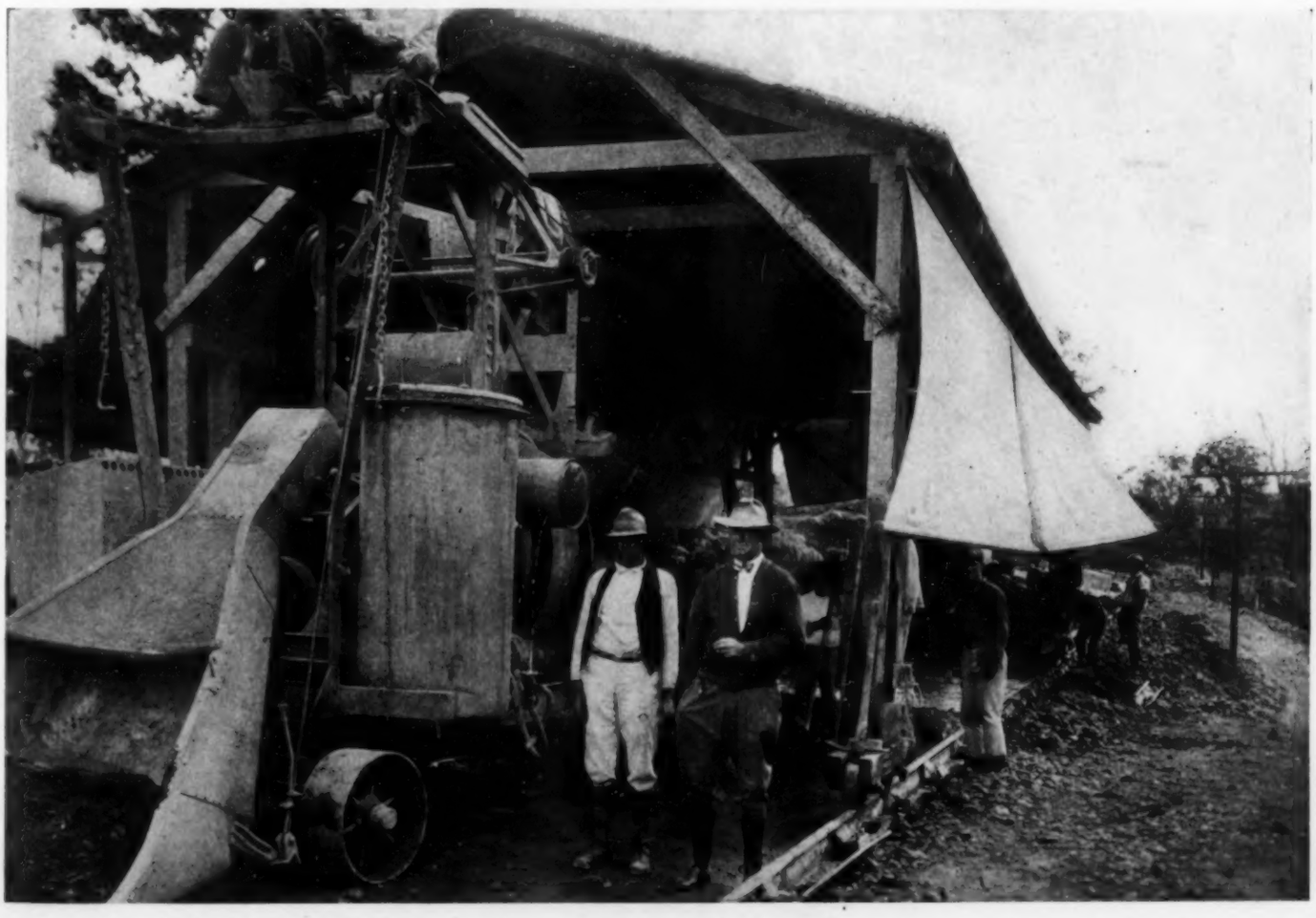
FINISHING SHOULDERS *(above)* on Illinois highways. Harrison Engineering Company uses a specially designed inclined bucket conveyor rig delivering into light trucks.

IN SINKING CAISSONS *(left)* for the University bridge over the Schuylkill River, at Philadelphia, the Dravo Contracting Co., of Pittsburgh, built temporary circular steel-pile fenders at the ends of the caisson for protection against river craft, ice and other hazards.

BACKFILLING A TRENCH 3 ft. wide and 5 ft. deep for a 12-in. water main at Troy, Ohio, was done in quick time with a Miami scraper rig operated by cable from a tractor which moved along the street as work progressed.

FOR BRIDGE PAVING. *(Above)* Elevated hopper on wheels receives concrete and spouts it to place for Cornell Contracting Co. in paving deck of Outerbridge Crossing, the new bridge connecting Staten Island, N. Y., and New Jersey.

"WETS" AND "DRYS" *(right)* clashed again in preparing the foundation for the Beardsley dam near Phoenix, Ariz. The "dry" forces, led by Carl Pleasant, contractor, won out handsomely with the aid of a pair of Byron-Jackson pumps slung from a cableway across the dam site.



ROAD-BUILDER'S UMBRELLA. To prevent delays, due to incessant rains, in paving the 6¼-mile Volcano Road in Hawaii, the Hawaiian Contracting Company used this mobile shed 50 ft. long to protect mixer and finishing machine. Similar sheds, lower in height, covered about 300 ft. of finished paving. "The system worked well," said Frank West, superintendent for the contractor. "We lost only two days' concreting on account of rain."

Skyscraper Piers *Carry Two*

CONSTRUCTION of the two great bridges over the Arthur Kill, between Staten Island, N. Y., and New Jersey, was completed 5 months ahead of schedule. A bonus of $400 offered by the Port of New York Authority for each day saved induced the contractors to expedite the work. As a consequence the bridges, which are toll structures, began producing revenue July 1.

The main spans have a clearance of 135 ft. over the channel of the Arthur Kill. To attain this elevation long approaches are necessary; they are carried on arched piers of reinforced concrete. Cantilever steel trusses form the main spans, while the approach structures are of the deck plate-girder type.

The Goethals Bridge, between Elizabeth, N. J., and Howland Hook, Staten Island, is 8,600 ft. long between entrance plazas with a channel span of 672 ft. The Outerbridge Crossing, between Perth Amboy, N. J., and Tottenville, has a total length of 10,140 ft. and a main span of 750 ft. Each bridge has more than 70 approach

APPROACH to Goethals Bridge from Howland Hook required 36 large concrete piers. Traveling derrick on steel falsework erected deck plate-girder spans.

Bridges Across Arthur Kill

piers. Including the channel span supports there are a total of 153 large concrete piers for the two bridges.

Substructure Methods

Three companies were awarded the contracts for building the substructures of the four approaches on July 29, 1926. Two sections (profile sketches, pp. 26 and 27) at Howland Hook and Tottenville, both on Staten Island, were awarded to the Frederick Snare Corporation. The Triest Contracting Corporation obtained the Elizabeth contract, and the Perth Amboy section was given to the Cornell Contracting Company.

All the contractors faced a similar problem. To erect a series of arched reinforced-concrete piers ranging in height up to 130 ft. over distances varying from 3,070 ft. at Elizabeth to 4,698 ft. at Perth Amboy. For excavating the land piers, crawler cranes with clamshell buckets were used on all sections. Stiff-leg derricks took care of the piers near the bulkhead line and floating plants operating orange-peel buckets, excavated for the channel piers.

Concrete had to be produced in quantity and raised to different elevations. Because of their flexibility and mobility, plants consisting of paving mixers, cranes, and elevator masts were the common choice for this work. Materials were delivered in batch trucks from dealers' yards about a mile away. On the Howland Hook approach, however, swampy ground made advisable a central mixing plant on piles off shore where it could be served by barges even at low-tide.

In placing concrete for the pier bases paving mixers discharged directly. For greater height cranes were used to lift bottom-dump buckets. When crane booms fell short elevator masts were erected to place the concrete. The maximum tower was 160 ft. high. Floating mixing plants concreted the river piers.

On the Howland Hook approach D. H. Cameron, superintendent for the Frederick Snare Corporation encountered soft ground at anchor pier D, requiring extra heavy bracing of the cofferdam. Three frames of 12 x 12's, 5 ft. on centers, were erected above ground. Arch-web steel sheetpiling 15 in. wide and 50 ft. long, was driven around them.

Similar methods were used on the seventeen approach piers nearest the Kill. Straight-web piling, 26 ft. long, was adequate here. None of the remaining piers was over 16 ft. deep and 6 x 12-in. tongued-and-grooved lumber and 3 x 12-in. planks were used on most of the holes.

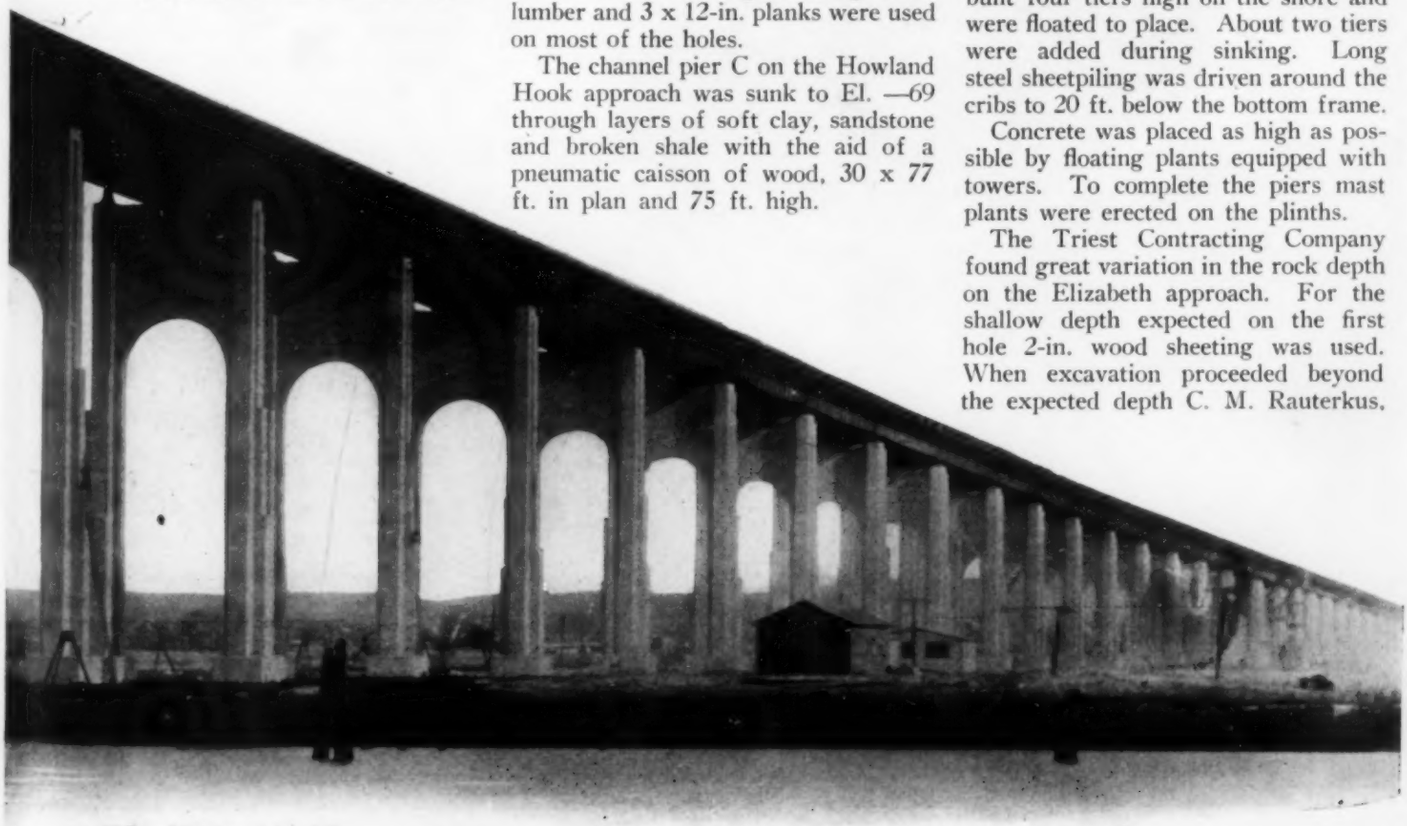
The channel pier C on the Howland Hook approach was sunk to El. —69 through layers of soft clay, sandstone and broken shale with the aid of a pneumatic caisson of wood, 30 x 77 ft. in plan and 75 ft. high.

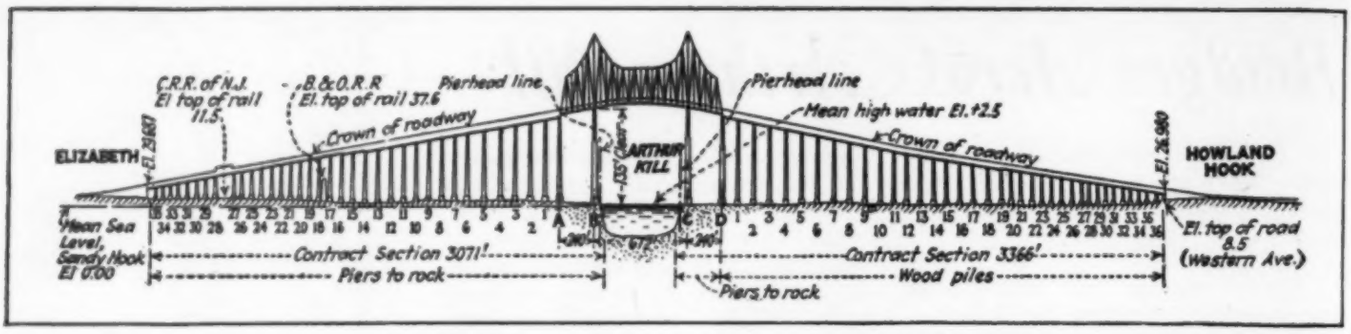
ERECTING STEEL for the 750-ft. main channel span of the Outerbridge Crossing.

The four channel piers on the Outerbridge Crossing were sunk with open cofferdams by Superintendent John Pierson. Wooden cribs were built four tiers high on the shore and were floated to place. About two tiers were added during sinking. Long steel sheetpiling was driven around the cribs to 20 ft. below the bottom frame.

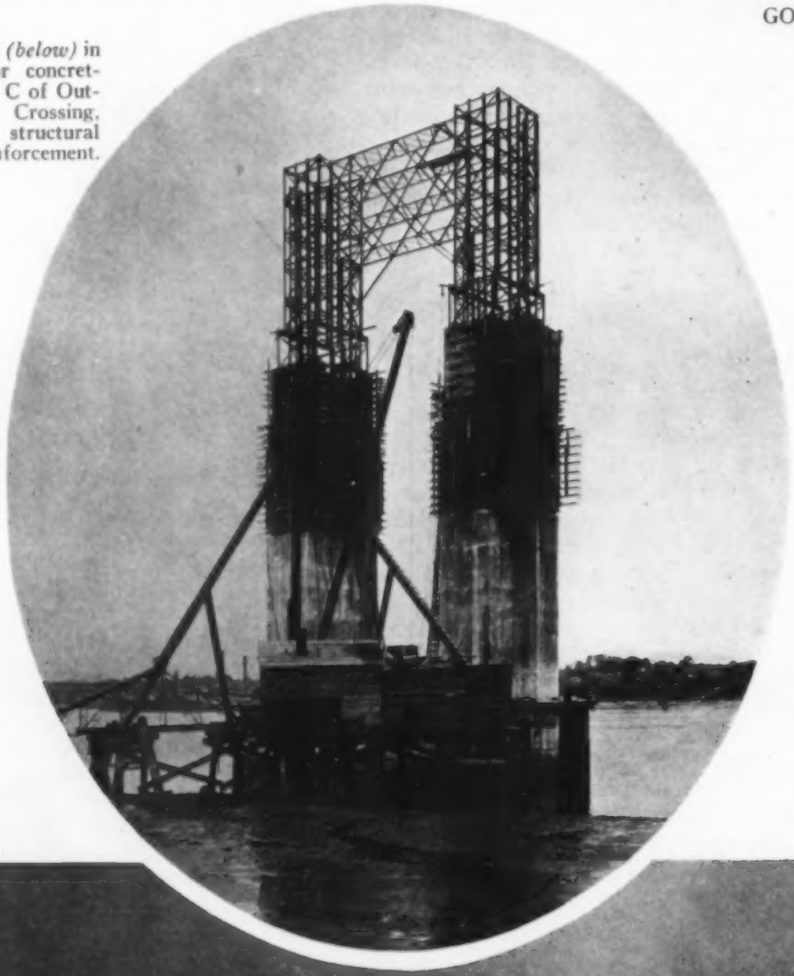
Concrete was placed as high as possible by floating plants equipped with towers. To complete the piers mast plants were erected on the plinths.

The Triest Contracting Company found great variation in the rock depth on the Elizabeth approach. For the shallow depth expected on the first hole 2-in. wood sheeting was used. When excavation proceeded beyond the expected depth C. M. Rauterkus,





GOETHALS BRIDGE, from Elizabeth to Howland Hook, has 71 approach and 4 channel piers.



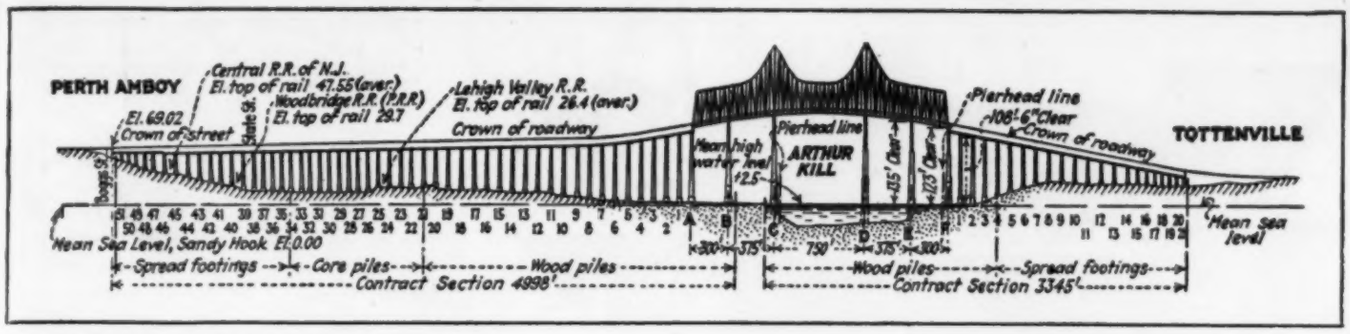
FORMS *(below)* in place for concreting Pier C of Outerbridge Crossing, showing structural steel reinforcement.

superintendent, continued to rock with the same thickness of sheeting. So successful was the use of 2-in. lumber on this pier that all other holes, even as deep as 50 ft., were sheeted in the same way.

The channel pier on the Elizabeth approach was sunk by open cofferdam and was carried 22 ft. into rock, which lay close to the surface, to provide for future deepening of the ship channel.

The Cornell Contracting Company had bad soil conditions to contend with on the Perth Amboy approach. Superintendent J. O'Keefe used closely braced steel sheetpile cofferdams up to and including pier 7. The successful method finally developed for sinking these holes consisted first of driving sheet piles and placing braces as excavation proceeded. At the first sign of distress, three lines of support piles were driven to refusal around the inside of the cofferdam. Braces were installed between pile heads and between piles and sheetpiling.

CANTILEVER SPANS of Outerbridge Crossing on their way to a meeting point high above the Arthur Kill.

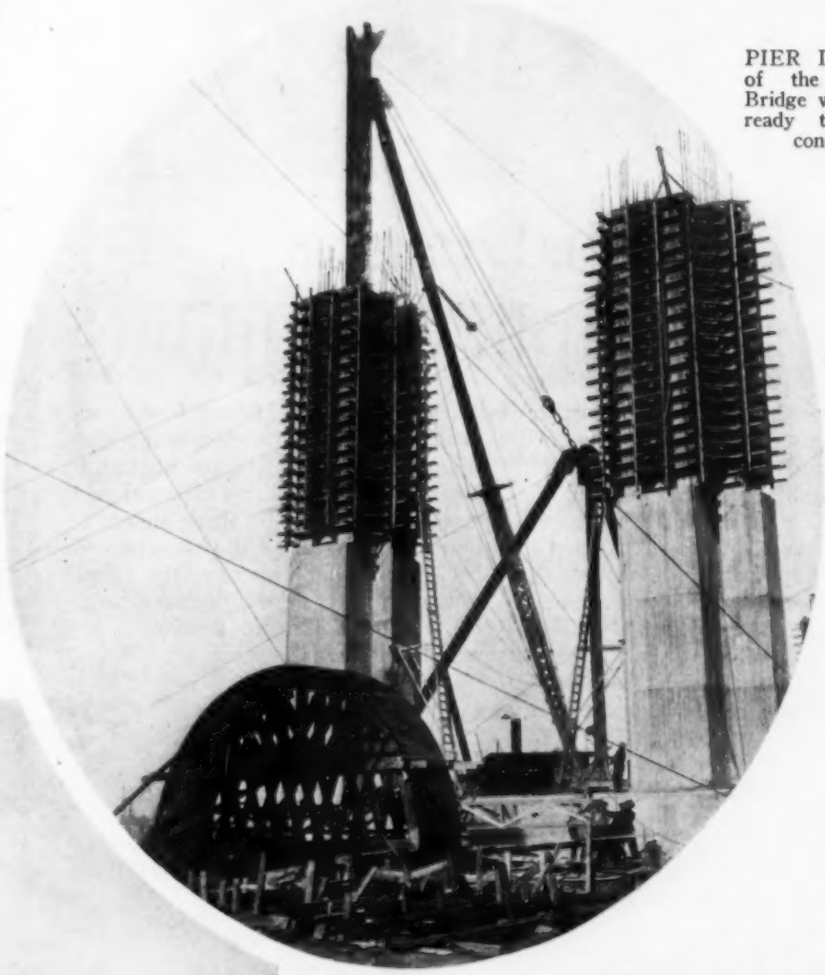


OUTERBRIDGE CROSSING, from Perth Amboy to Tottenville, has 73 approach and 6 channel piers.

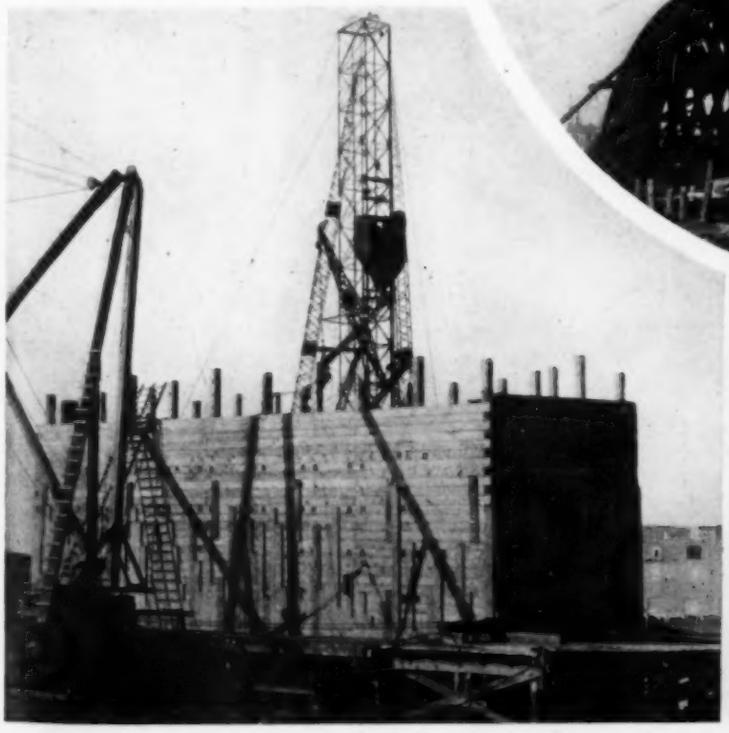
Pile foundations were specified for a number of the piers. On thirteen piers near the center of the work, where dry ground made impossible the use of wood piling, concrete piles were required. Because of uncertainty as to the refusal depth the contractor decided to use Raymond cast-in-place piles.

The Goethals Bridge steel was fabricated and erected by the Bethlehem Steel Company under the supervision of W. A. Hazard. The McClintic-Marshall Company performed the same work for the Outerbridge Crossing, with D. S. Gendell and E. L. Durkee in charge.

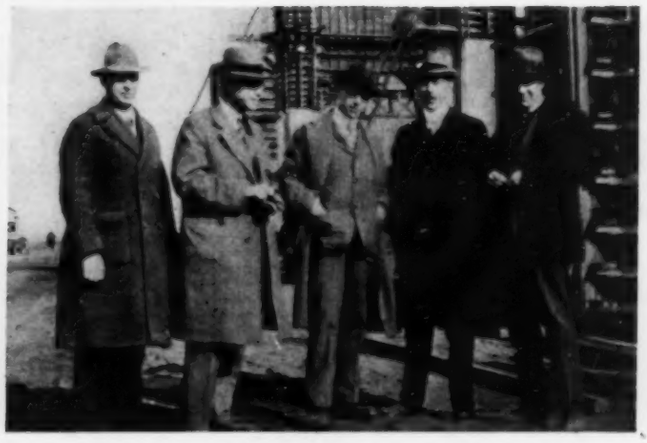
The bridges were built by the Port of New York Authority. O. H. Ammann, bridge engineer, and William J. Boucher, engineer of construction, were in charge of operations. Contractors' engineers on the job were Randall Cremer, for the Frederick Snare Corporation, and S. Kent, for the Cornell Contracting Company.



PIER D *(below)* of the Goethals Bridge with forms ready to receive concrete.



CAISSON ready for sinking at one of the channel piers.



A FEW of the bridge-builders assembled on the Tottenville side.

BRICKLAYERS (*left*) worked from the inside. Because the design eliminates outside columns, pilasters and beams, no scaffolds are needed in building the curtain walls.

Mushroom Design Simplifies Building

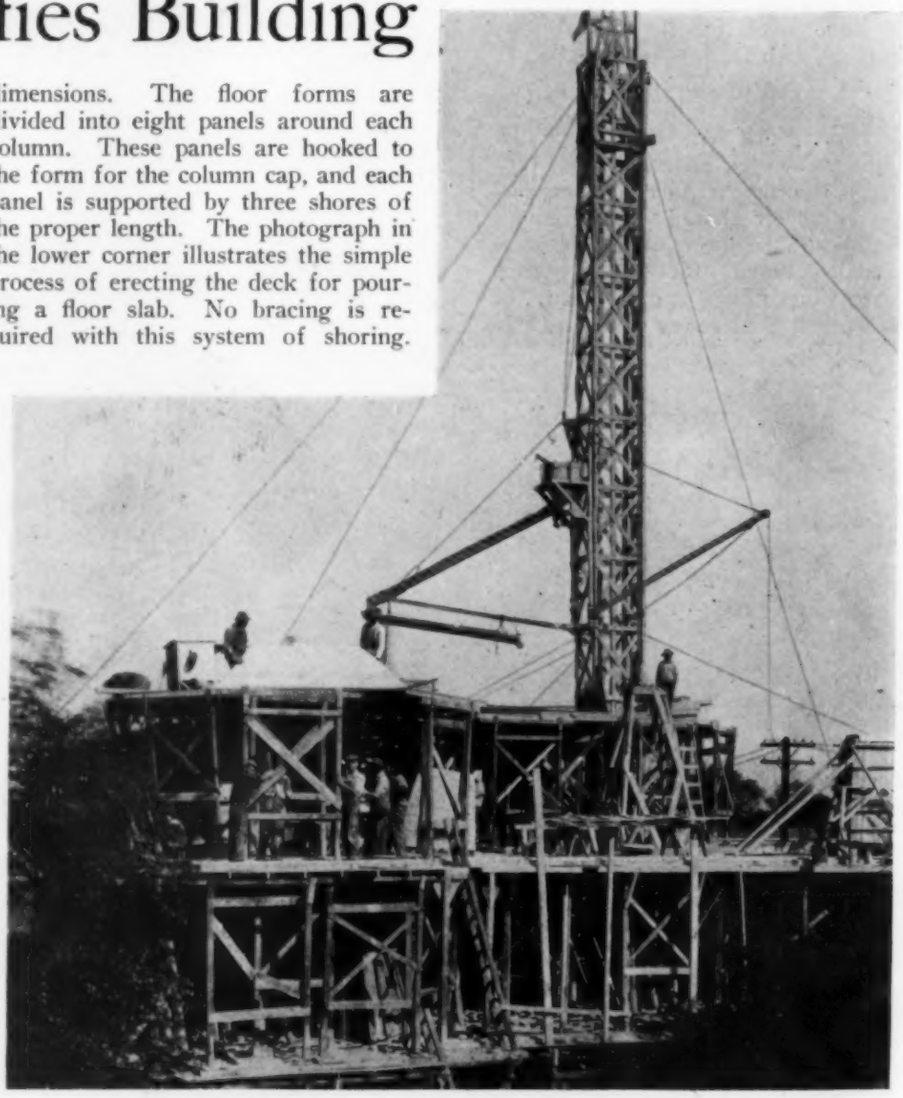
THE mushroom type of construction used in the Rotherwood Apartment, Indianapolis, Ind., greatly simplified operations for the builder. This reinforced-concrete structure, instead of being designed in the usual way with each rectangular floor section resting on four columns, was built with balanced cantilever slabs supported by, and integral with, single columns. The unusual design reduced the labor of erecting forms and placing steel, eliminated need of scaffolds for laying brick in the curtain walls, and facilitated installation of mechanical fixtures such as pipe and conduit.

The building was planned and erected by the Foster Engineering Service Co. of Indianapolis under its patent covering the Foster "Unit Slab." In the patent, "Unit Slab" is described as "a column, a slab integral therewith —said slab tapering laterally from the column so as to have a decreasing thickness in all directions from the column." A general idea of the design may be gained from the photograph at the top of the page. It will be noticed that no supporting columns are placed at the edges of the floors. Just as the outside portion of the slabs are cantilevered beyond the columns, so is each slab balanced upon, and cantilevered on all sides beyond, a single column. The slabs, of course, are made integral, being tied together with reinforcing steel.

Forms are made in sections by the Foster Engineering Service Company to fit standard spans and column dimensions. The floor forms are divided into eight panels around each column. These panels are hooked to the form for the column cap, and each panel is supported by three shores of the proper length. The photograph in the lower corner illustrates the simple process of erecting the deck for pouring a floor slab. No bracing is required with this system of shoring. The forms can be erected and wrecked with ease.

Although the floor panels are made for standard spans, column to column, any extra distance can be taken care of by filler panels. On the Rotherwood Apartment the columns were spaced 19 ft. 6 in. by 23 ft. 6 in.; but standard 19-ft. panels were used for the slabs, the additional span being covered by flat panels. The sectional forms on this building had been used three times.

No scaffolds are needed for laying the brick in the curtain walls. As outside columns, pilasters and beams are eliminated by this design, bricklayers can work from the inside and can lay the top courses of each story by leaning over the edge of the floor above. The slabs are designed to carry the wall load and bricklaying may be started on any floor.



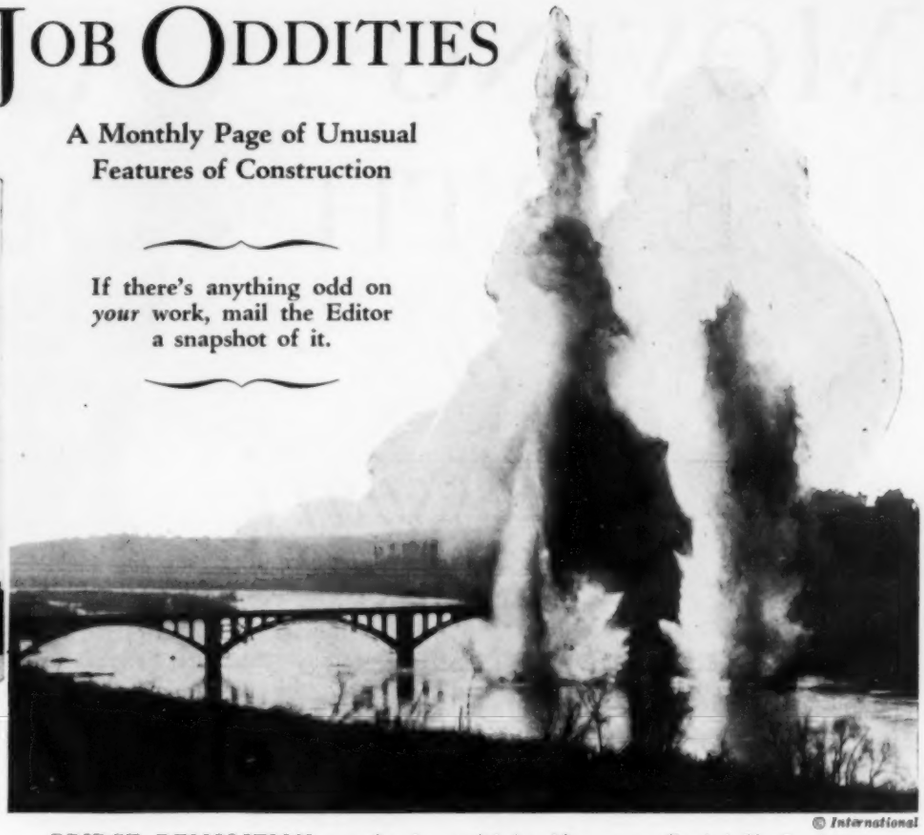
DECK FORMS for the slab are made in eight panels which are hooked to the form for the column cap and are supported by three shores of correct length.

JOB ODDITIES

A Monthly Page of Unusual Features of Construction

If there's anything odd on *your* work, mail the Editor a snapshot of it.

MUSIC AND WATER SUPPLY service are combined in this French structure at Tergnier, where the base of an elevated tank is designed to serve as a bandstand, according to *La Technique Des Travaux.*



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BRIDGE DEMOLITION practice by aerial bombing was afforded U. S. Army aviators when a structure in the path of a power development on the Pee Dee River in North Carolina was rendered useless. A new dam will back up water above the elevation of the bridge.

© International

STREET PIERCES SKYSCRAPER. Viaduct around Grand Central Terminal in New York carries roadway through new 35-story New York Central Building, forming link with Park Avenue to relieve traffic congestion.

© International

BLUEPRINT PLANS, stress sheets, live load assumptions and the other technical paraphernalia of the designing engineer played no part when local tribesmen constructed this suspension bridge of fibrous cane across the Dihang River in Thibet.

MOVING EARTH *in Missouri*

L. E. GREATHOUSE *(left)*, general superintendent for the C. P. O'Reilly Construction Co. and A. B. McNamee, of McNamee Brothers.

ONE of the heaviest grading contracts ever let by the Missouri State Highway Commission was completed last spring in the central part of the state by the C. P. O'Reilly Construction Company of St. Louis. For 10 miles east of Jefferson City, U. S. Route 63 was relocated to reduce the number of curves from 72 to 22 and the maximum grade from 9 per cent to 6 per cent. The new road also shortens the distance approximately 1 mile.

Construction began in March, 1927. The original date set for completion was Dec. 1. As the estimates included 188,000 cu.yd. of earth excavation, 5,500 cu.yd. of loose rock, 73,500 cu.yd. of solid rock, 105,000 cu.yd. of borrow, and 436,000 station-yd. of overhaul, a well-equipped organization was needed to complete the work in 8 months. The C. P. O'Reilly Construction Company was able to put the necessary force of men and machines in the field. Finishing dates for sections of the contract later were postponed from three to four months because of unavoidable delay in issuing notices to proceed.

CUT AND FILL approach to a bridge on Section C. A gas-air shovel was used here, rather than an elevating grader, because of the depth of the cut and the presence of some rock.

The 10 miles under construction was designated as Federal Aid Project 1 and was divided into Sections A, B, and C. For three-quarters of a mile within and just outside the limits of Jefferson City, Section A followed the old road. The rest of Section A and all of the two other sections were on new location. Different parts of the work were performed by subsidiary units of the C. P. O'Reilly Construction Company. McNamee Brothers did the grading and built the structures on Section A, approximately 2.8 miles long, and the same class of work on Sections B and C was performed by Murphy Brothers. J. R. Hancock built the three bridges included in the projects. L. E. Greathouse, general superintendent, was in charge of the entire project for the contracting company.

Heavy Cuts Necessary

The new location to improve alignment made heavy cuts necessary to reduce the grades. On Bogg's Hill, Section A, is the heaviest cut of the project, 48 ft. deep on the high side. Approximately 26,000 cu.yd. of rock was removed from this cut. The formation consisted mainly of stratified limestone overlaid with 8 ft. of earth. A steam shovel of ¾-cu.yd. capacity worked from March to November, taking out the rock in two lifts. Portable compressors, one tripod drill, and hand drills were used to do the drilling. The rock was removed from the cut in 4-cu.yd. side-dump cars. These cars were let down by gravity from the shovel to the fill and were returned in two-car trains by a hoist belt-driven

from a tractor. A second steam shovel, with a 1-cu.yd. dipper, also was used on Section A.

Much of the grading on the project was done with elevating graders and dump wagons. Five loaders of this type, all drawn by 10-ton tractors, were at work on the three sections. The unusual amount of overhaul, due to great distances between the balance points, made a large number of stock necessary. McNamee Brothers had 90 mules and Murphy Brothers had 80.

A 1-cu.yd. gas-air shovel and a ¾-cu.yd. steam shovel made the heavy cuts on Sections B and C. In some of these cuts small dump cars were used to haul away the excavated material. Three-car trains were dropped down to the fill by gravity and were pulled back by mules. When dump wagons were used to haul rock on these sections, the load was dumped on top of the fill and was bulldozed with a tractor.

The longest bridge on the project was that over the Moreau River. This structure has a steel span of 180 ft. and six concrete deck girder approach spans totaling 246 ft. 9 in. Piers were carried to 24 ft. below low water level, where they rest on timber pile foundations driven to bedrock, 45 ft. below low water. The bridge is only 1 mile from the confluence of the Moreau and Missouri Rivers. Backwater from the Missouri River during the great floods of 1927 seriously hampered construction of the bridge. The two other bridges are of the deck girder type and have spans of 40 ft. and 50 ft.

GRAVEL SURFACING of a temporary nature was placed on the road in the Bogg's Hill cut to carry traffic through the winter. This rock cut, the deepest on the project, was removed in two lifts by a ¾-cu.yd. steam shovel.

As mentioned before, L. E. Greathouse superintended the work for the C. P. O'Reilly Construction Company, St. Louis. Each division of the construction program was personally managed by the subsidiary operators. The project was under the supervision of T. H. Cutler, chief engineer of the Missouri State Highway Commission. Marcus Sagal was resident engineer. For the U. S. Bureau of Public Roads W. H. Lynch, district engineer at Omaha, Neb., was in charge.

STEAM SHOVELS were used in the rock cuts. Most of the hauling was done with mules, and a great many stock were kept on the job. Tractors bulldozed much of the rock after it had been dumped on the fill.

ELEVATING GRADERS and dump wagons were employed in excavating the shallow cuts. A HOIST *(in circle)* belt-driven from a tractor returned the empty two-car trains to the shovel at Bogg's Hill.

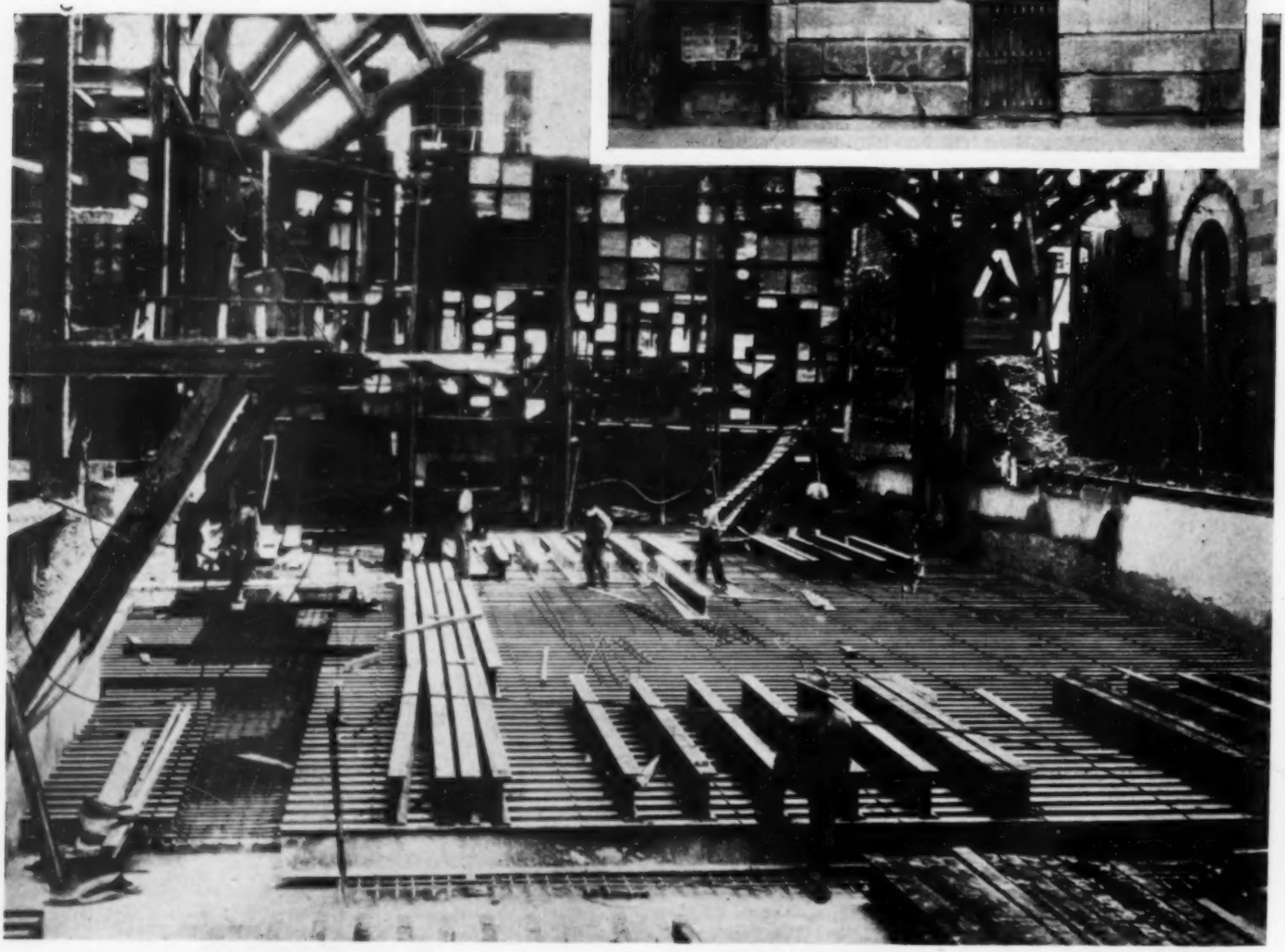
Crack-Proof Buildings
for Mexico City

BUILT on the unstable surface of an ancient lake bed, Mexico City offers unusual problems to the building designer and constructor. Buildings are tipping, walls cracking and foundations sinking as new structures disturb the balance of the soft, shifting soil.

H. S. Jacoby, chief engineer of the H. K. Ferguson Company, of Cleveland, recently made a study of these conditions and suggested remedies: Steel frames with cross-bracing and solid mat foundations are advocated. The mat should be near the surface of the ground, with very little excavating required. The superstructure also should be light, with not more than 1,000 lb. of building weight per square foot of foundation.

To achieve this light weight in Mexican buildings Mr. Jacoby suggests the use of steel lumber; bar joists; thin concrete floors with light-weight aggregate which can be obtained by using volcanic residue; roofs of gypsum to give a light and well-insulated covering, and walls of hollow tile, with insulating material between wall surfaces.

CRACKS *(right)* in walls and window frames, due to foundation settlement, have disfigured many buildings.



MAT FOUNDATIONS of concrete, heavily reinforced with steel, are recommended to give stability to Mexico City buildings.

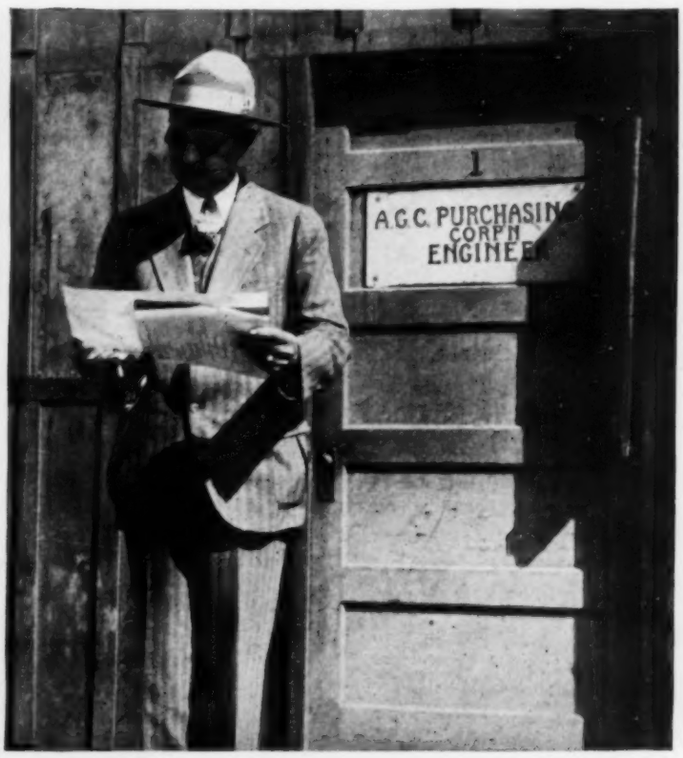
Present and Accounted For —

A Page of Personalities

GEORGE F. SCHLESINGER recently resigned as director of the Department of Highways of the State of Ohio to become chief engineer and managing director, July 1, of the National Paving Brick Manufacturers' Association.

HARRY J. KIRK, for the last three years chief engineer, has been promoted to become director of the Department of Highways of Ohio, succeeding George F. Schlesinger, resigned. Mr. Kirk has served with the state highway department since 1913.

BRIG.-GEN. THOMAS H. JACKSON, Corps of Engineers, U. S. Army, is the new president of the Mississippi River Commission, succeeding Brig.-Gen. Charles L. Potter, retired.



C. E. BRESSLER, in charge for a group of California members of the Associated General Contractors, of the big reconstruction program necessitated by the failure of the St. Francis dam this spring.

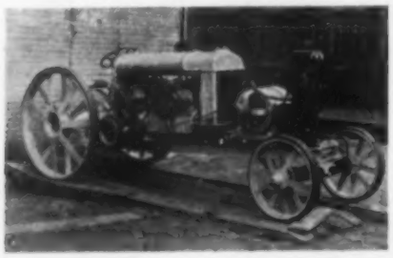
NEW EQUIPMENT ON THE JOB

Mobile Swing Crane

The new Loadmaster swing-crane, placed on the market by Frederic H. Poor, Inc., 50 Church St., New York, is designed for jobs where large and costly machines for handling materials are not justified. It is a movable power-driven unit, tractor mounted. It can handle loads over a 240-deg. swing at a radius of 10 ft. from the mast center. Adjustable telescoping outriggers are available at the sides when heavy loads are raised. All operations are performed by power from the tractor engine.

Tractor-Mounted Welder

Considerable saving over former methods of welding in pipe line construction and structural steel fabricating has been effected by providing the standard Lincoln electric stable-arc welder with a new mounting, according to its manufacturer, the Pontiac Tractor Co. of Pontiac, Mich. The welder unit, with stabilizer and panel, is mounted on a frame fitting either a McCormick-Deering 10/20 or a Fordson tractor. This mounting gives a 4-wheel, rubber-tired, self-propelled unit capable of hauling heavy loads. The unit may also be mounted on crawlers for soft ground work.



Power to drive the welder is taken from the tractor through a power take-off pulley with a clutch which allows it to be thrown out of or into gear at will. The drive of the belt brings the belt-tightener into the correct relation with the belt.

Safety Saw in Larger Size

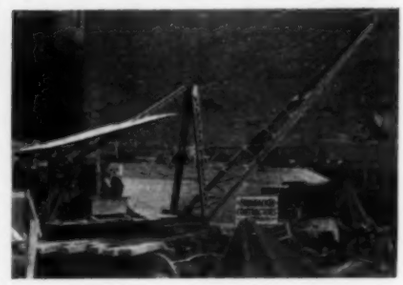
A power-operated safety saw making a cut 6⅛ in. deep and light enough to be operated and carried by one man, has been placed on the market by the Crowe Manufacturing Corporation, Cincinnati, Ohio, maker of portable electric and air-driven saws. At a recent demonstration, one man operating this new safety saw cut through 14x6-in. of oak in 20 sec. Crowe safety saws are made in five sizes, cutting 1½, 2½, 3, 4⅛, and 6⅛ in. The saws may be equipped with cross-cut, rip or combination blades. The electric saw is powered by a General Electric motor, and the air-driven saw is equipped with a special Ingersoll-Rand motor. The saw illustrated is cutting 6-in. timbers on a runway.

Portable Screening Plant

A portable screening and loading plant on two wheels, designed especially for use of gravel operators, is a recent product of the Northern Conveyor & Manufacturing Co., of Janesville, Wis. This plant, consisting of a shaker screen and conveyor is easily moved on the job and also from job to job. Its simplicity of design, the manufacturers claim, insures a lower maintenance cost.

Full Rotating Derrick

Dobbie all-steel full rotating derricks with 55-ft. booms, are the latest product of the Mundy Sales Corporation, New York City. The derrick revolves on a circular track of 8-ft. radius giving an effective working radius of 63-ft. It is built in 3 and 5-ton sizes weighing, respectively, 19,000 and 24,000 lb.



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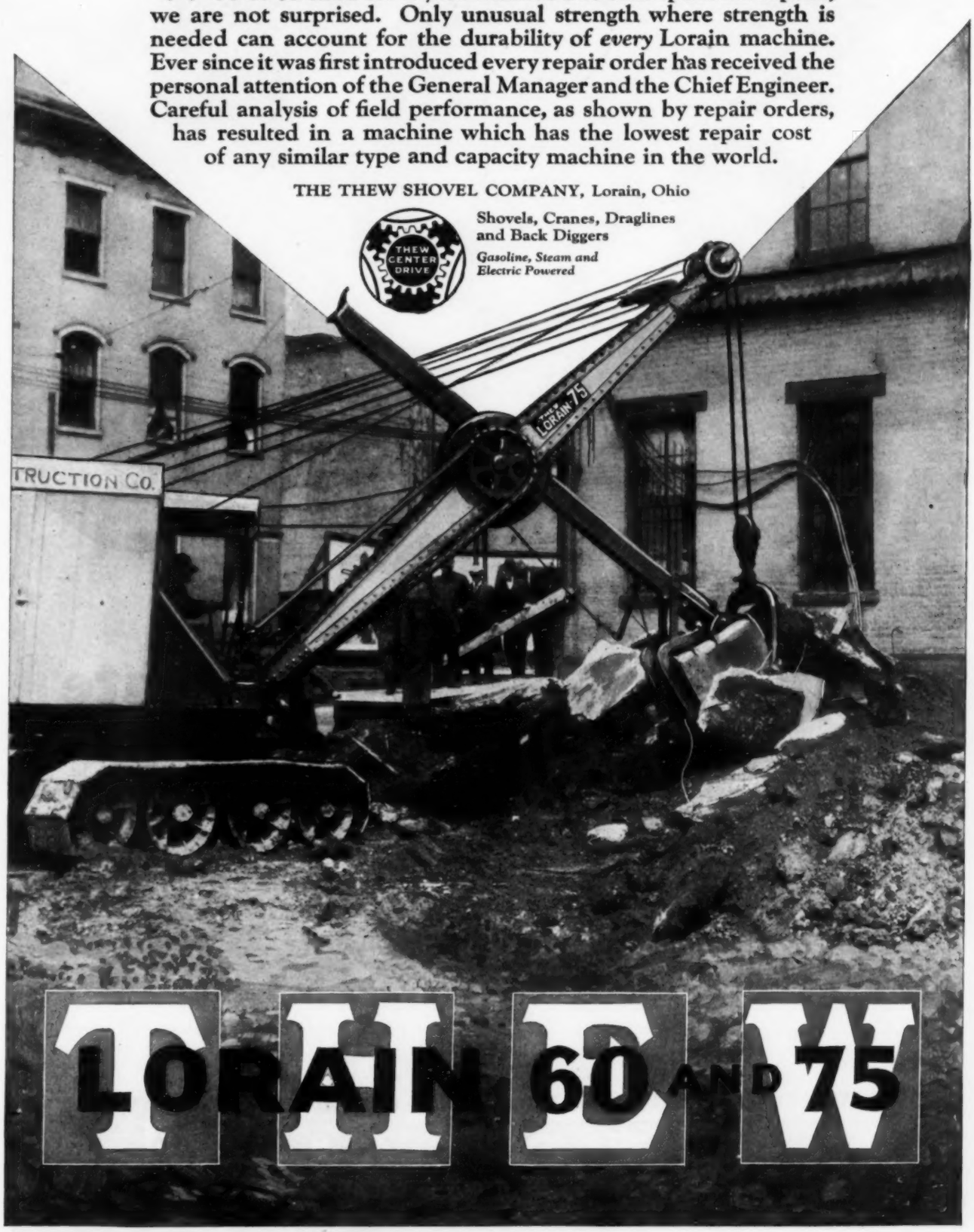
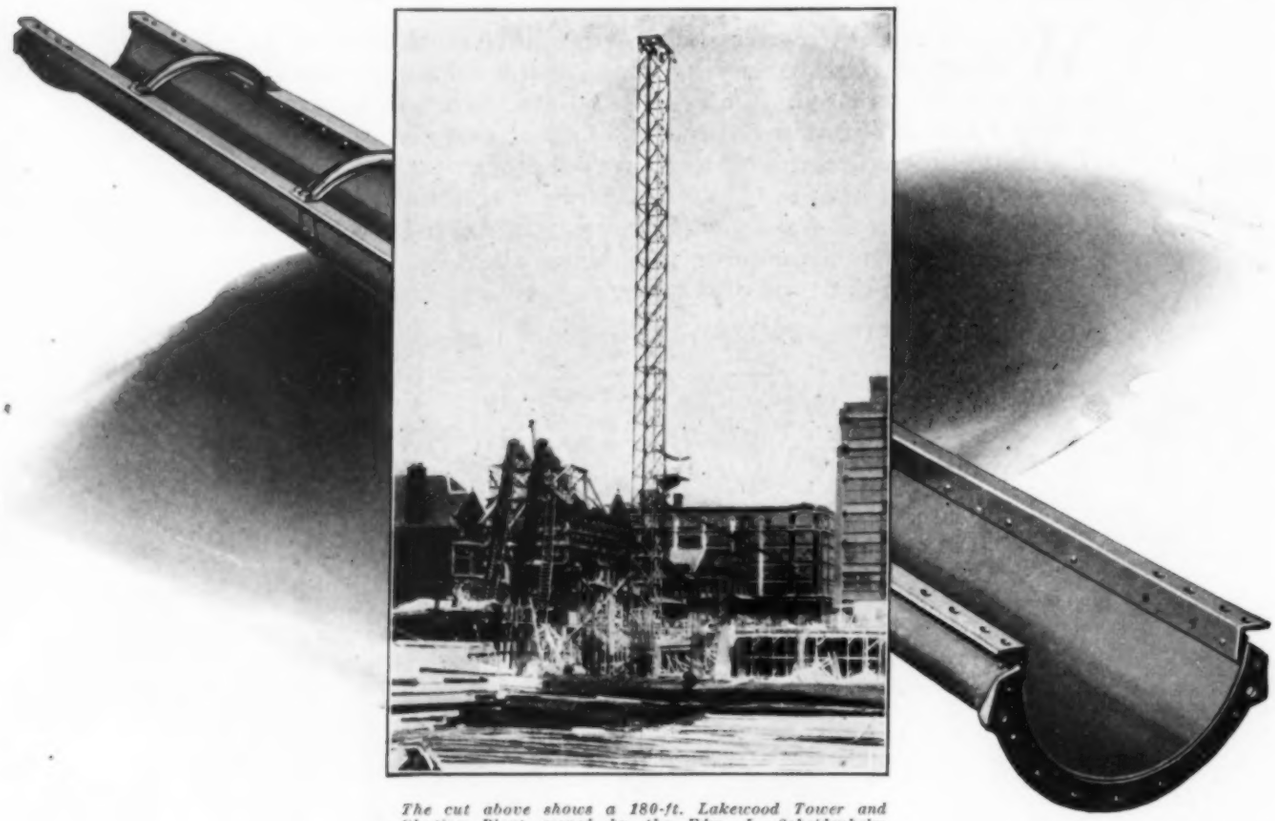


LAKEWOOD CONCRETE PLACING EQUIPMENT

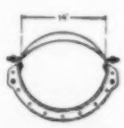


The cut above shows a 180-ft. Lakewood Tower and Chuting Plant owned by the Edw. L. Scheidenhelm Company of Chicago, Ill.

Only with Lakewood Chute

can you secure the advantage of the 14 inch half-round arch band cross section. It does handle dry concrete easier. Job after job has proved it.

Bulletin 23-S tells the whole story



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"Out-speeds, out-digs, out-travels and we are sure out-lasts all of them"

After running their first Gas+Air BUCYRUS-ERIE day and night for seven months, the Brown Constr. Co., of Sacramento, Calif.

bought another Gas+Air

And they write: "This machine has done so well for us that we are always glad to broadcast its merits. Our rock excavation is extremely tough lava— hard on machinery, and another shovel on this work showed a very excessive upkeep cost. But the parts bill on this Gas+Air BUCYRUS-ERIE has been extremely satisfactory.

"This month, running three shifts as a dragline, our estimate was over 40,000 yards. The Gas+Air BUCYRUS-ERIE out-speeds, out-digs, out-travels, and we are sure will out-last any of them."—*Brown Constr. Co., Sacramento, Calif.*

And have since bought another Gas+Air—

Because they have found that this machine's direct-connected crowding and swinging engines give unequalled speed on shovel work— and that the air operated swinging engines give much bigger output on dragline work, too.

Note what they write about low upkeep. This machine has the BUCYRUS-ERIE reliability.

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Excerpts From Mr. Johnson's Letter

"The corridor floors were concrete slab and the balance of the floors were concrete over metal lath and steel joist. We purchased an Insley Mast Hoist with a boom and counterweight chute, also a Material Elevator Platform. We are so well pleased with this outfit that we are writing to let you know what our experience with this plant has been.

"At first we thought that our job didn't have enough concrete to warrant such a plant but due to the attachment of your material hoist, we have found that it was a very profitable purchase. We hoisted everything necessary to erect the building with one double drum hoist and one engineer.

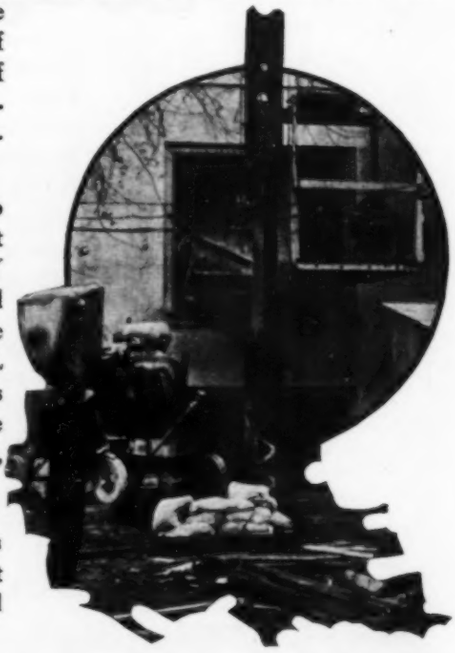
"We find the chuting of concrete to be a big saving over wheeling, as it eliminates all runways which are very expensive due to necessary height from the floor.

"The erection cost on our job was only $200.00.

"In conclusion we can highly recommend this plant for any kind of a building where hoisting is necessary."

CHUTING A SMALL YARDAGE OF CONCRETE

THE Walter S. Johnson Building Co., Niagara Falls, N. Y., were awarded a contract for a hospital during the summer of 1927. The building was reinforced concrete throughout, but the floors were of light construction consisting of concrete over metal lath, as a result of which the concrete yardage of the job was small.



How best to handle this job was a problem which was met satisfactorily by an INSLEY MAST HOIST with a boom and counterweight chute, with a three wheelbarrow MATERIAL ELEVATOR. The chutes placed all the concrete and the elevator hoisted all the brick, tile, etc.

This plant was so successful that Mr. Johnson characterized it as "a very profitable purchase." Read what he says about his Mast Hoist, and remember it when you next have a big job with a small amount of concrete.

608

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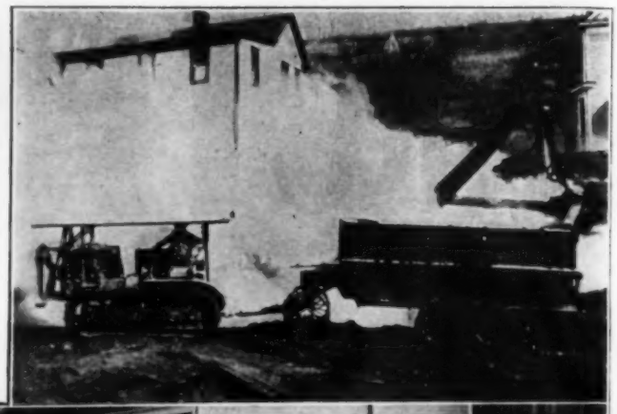

This mine refuse caught fire . . . it had to be moved! "Caterpillars", a steam shovel and track-type dump wagons tackled this hot job . . . plenty of power and ample traction conquered it in jig time! Wherever earth is to be moved from a wrong place and put in a right place "Caterpillars" help to do the work *better, quicker, cheaper!*

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WIRE ROPE

Illustration shows a construction view on the Chumstick Cut-Off in Washington. Work is being done by A. Guthrie & Co., Inc. Shovel is equipped with "HERCULES" (Red-Strand) Wire Rope.

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"HERCULES" (Red-Strand) Wire Rope is made in both Round Strand and Patent Flattened Strand constructions in order to meet all working conditions. Tell us how you use wire rope and we shall be glad to suggest the right construction for best results.

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Goodbye *to* Water Hammer

that's been wrecking your pipe lines

The destructive water hammer—hammer—hammer—that's been wrecking pipe lines and pumps long before their time is whipped and whipped completely by Novo High Speed Triplex Road Pumps.

The Novo runs at 200 r. p. m. instead of the customary 65 r. p. m. That means 600 water strokes per minute. The rapidity of the water strokes reduces the hammering, caused by ordinary pumps, to a mere ripple. And the pressure at the mixer is steadier and stronger.

But that's not all. The Novo Triplex Road Pump is astonishingly vibrationless—and far lighter in weight than most. Flud Oiled Lubrication floods every moving part with oil. And the new Novo patented automatic relief valve holds the line pressure steady. When water is not being used, the relief valve keeps the pump from working against line pressure.

Novo Triplex Road Pump in Winter Service

A special catalog describes Novo Road Pumps in detail. In the interests of better pumping, write for your copy today.

There are other Novo Road Pumps, ranging from 80 gallons to 110 gallons per minute. They're listed in the same catalog. Send for a copy.

NOVO ENGINE COMPANY, 214 Porter Street, Lansing, Michigan

CLARENCE E. BEMENT, Vice-Pres. and Gen. Mgr.

NOVO

PUMPS — ENGINES — HOISTS

Service, parts and sales in 65 cities

Would $62.00 a Year

COVER YOUR CRANE REPAIR PARTS BILL?

That's the Average Cost on a Universal

$62.00 per year per crane was the average repair part sales for the hundreds of Universal Cranes in the field last year—a figure which closely approximates the yearly average repair part sales per Universal Crane for the last 9 years. Surely such freedom from repairs and costly machinery breakdowns is proof of Reliability, insuring you the most constant service you can demand on hard, steady, long, unbroken days, weeks and months of Money Making Performance.

Ask for Bulletin 36-L. It shows many of the jobs on which Universals give this reliable money making performance.

THE UNIVERSAL CRANE CO.
995 Swetland Building ... Cleveland, Ohio

UNIVERSAL
CRANES DRAGLINES SHOVELS TRENCH HOES
LARGEST *and* ONLY EXCLUSIVE BUILDERS *of* TRUCK CRANES

fifteen

for the Bitulithic Companies of Texas

That's proof of steady footage and profit!

The Foote Company, Inc., *of Nunda, N. Y.*
World's largest exclusive builders of road pavers

FRANK E. HALL
152 W. 42nd St.
New York City

WILCOX BROS., Inc.
588 Chenango St.
Binghamton, New York

E. J. McHARG & CO.
31 Crestmont Rd.
Binghamton, New York

MULTIFOOTE
The Paver with Timken Bearings

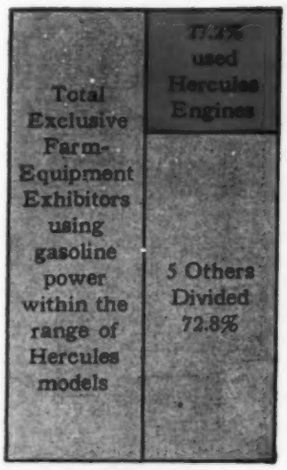
CM8Gray

MULTIFOOTE SALES CO.
2811 W. Fulton St.
Chicago, Ill.

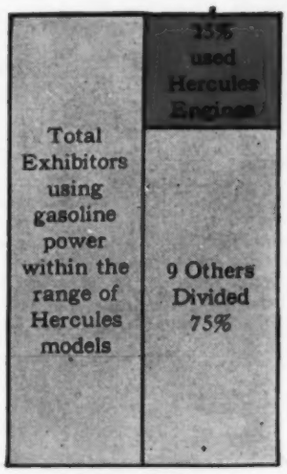
BURTON FRANKLIN
Volunteer Bldg.
Chattanooga, Tenn.

EDWARD R. BACON COMPANY
Folsom at 17th Streets
San Francisco, Calif.

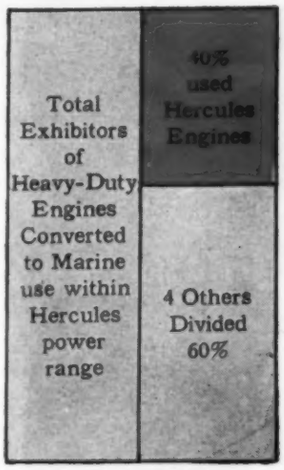
Hercules Engines


Total Exclusive Farm-Equipment Exhibitors using gasoline power within the range of Hercules models
27.2% used Hercules Engines
5 Others Divided 72.8%

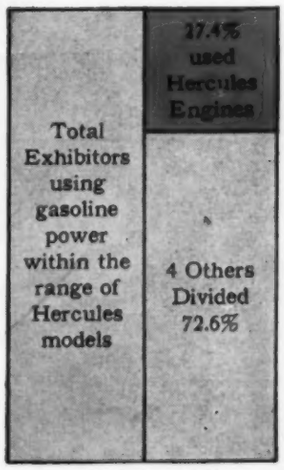
Southwestern Road Show
Wichita, Feb. 21-24, 1928


Total Exhibitors using gasoline power within the range of Hercules models
25% used Hercules Engines
9 Others Divided 75%

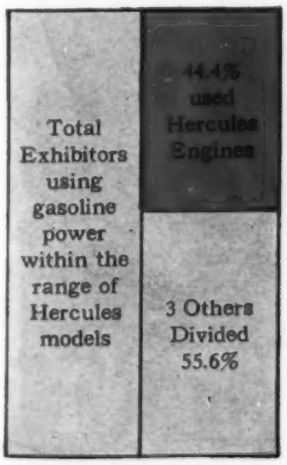
American Road Builders' Ass'n Convention and Road Show
Cleveland, January 9-13, 1928


Total Exhibitors of Heavy-Duty Engines Converted to Marine use within Hercules power range
40% used Hercules Engines
4 Others Divided 60%

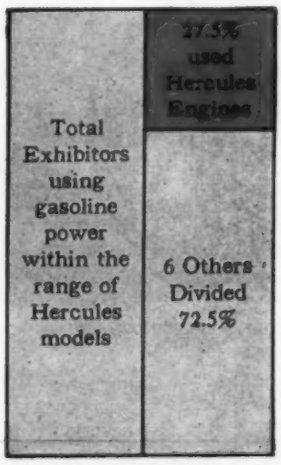
Motor Boat Show
New York City
January 20-28, 1928


Total Exhibitors using gasoline power within the range of Hercules models
27.4% used Hercules Engines
4 Others Divided 72.6%

Western Road and Equipment Exhibition
Los Angeles, March 7-11, 1928


Total Exhibitors using gasoline power within the range of Hercules models
44.4% used Hercules Engines
3 Others Divided 55.6%

National
Railway Appliance Show
Chicago, March 5-8, 1928


Total Exhibitors using gasoline power within the range of Hercules models
27.5% used Hercules Engines
6 Others Divided 72.5%

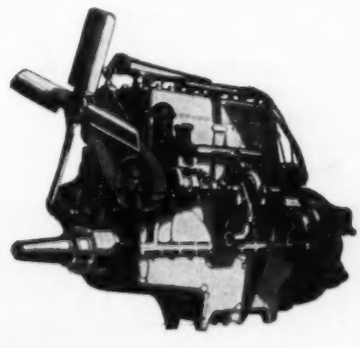
Fourth National
Petroleum Exposition
Tulsa, Sept. 24-Oct. 1, 1927

EXHIBITIONS are sign-posts to show the ways to do work faster—better—more economically. Even more, they show improvements and trends toward new standards. Outstanding successes can be picked. The underlying reason for these successes must be *performance*. Unequalled performance always means an outstanding success.

That is why it is safe to judge comparative performance by comparative acceptance. The wide use of Hercules Engines in equipment for a variety of purposes, as shown by actual count at recent shows, proves conclusively that Hercules Engines are effecting faster schedules, better planning of work, and lower power costs.

The advantages which are exclusively the result of Hercules inbuilt superiority are typical of every Hercules Engine, whether of the four-cylinder or six-cylinder type. Consequently Hercules Engines and Power Units are setting new records of power output within the range of 20 horsepower to 115 horsepower.

HERCULES MOTORS CORPORATION
CANTON, OHIO, U. S. A.



ACCEPT NO SUBSTITUTE

Sterling

riveted on "extra leg shoe" gives twice the wearing life.

This is another feature found in Sterling barrows and proves again the Sterling slogan—*"They cost less per job to use."*

The heavy steel shoes which are bent square instead of round and riveted to the foot portion of the channel steel leg saves wear on the leg proper. These shoes may be cheaply replaced when worn thru.

Study the whole under construction of a Sterling—then compare it with any other. You will quickly see why Sterlings give you the most for your money.

In the leg assembly channel steel, of extra strength, is used. Scientifically formed to give the greatest rigidity. Snug fitting to the handle. Riveted construction—can't wobble. Crossed and diagonally braced. All of these are important features for you to consider. Don't buy a wheelbarrow by looking at the tray but examine its under construction. There is where the real tough strains come and *it is there that Sterling excells.*

Buy by Sterling name—leading hardware and equipment dealers have them or they can get them quickly from our complete stock warehouses at Chicago, New York, Philadelphia, Pittsburgh, Cleveland, Detroit, St. Louis

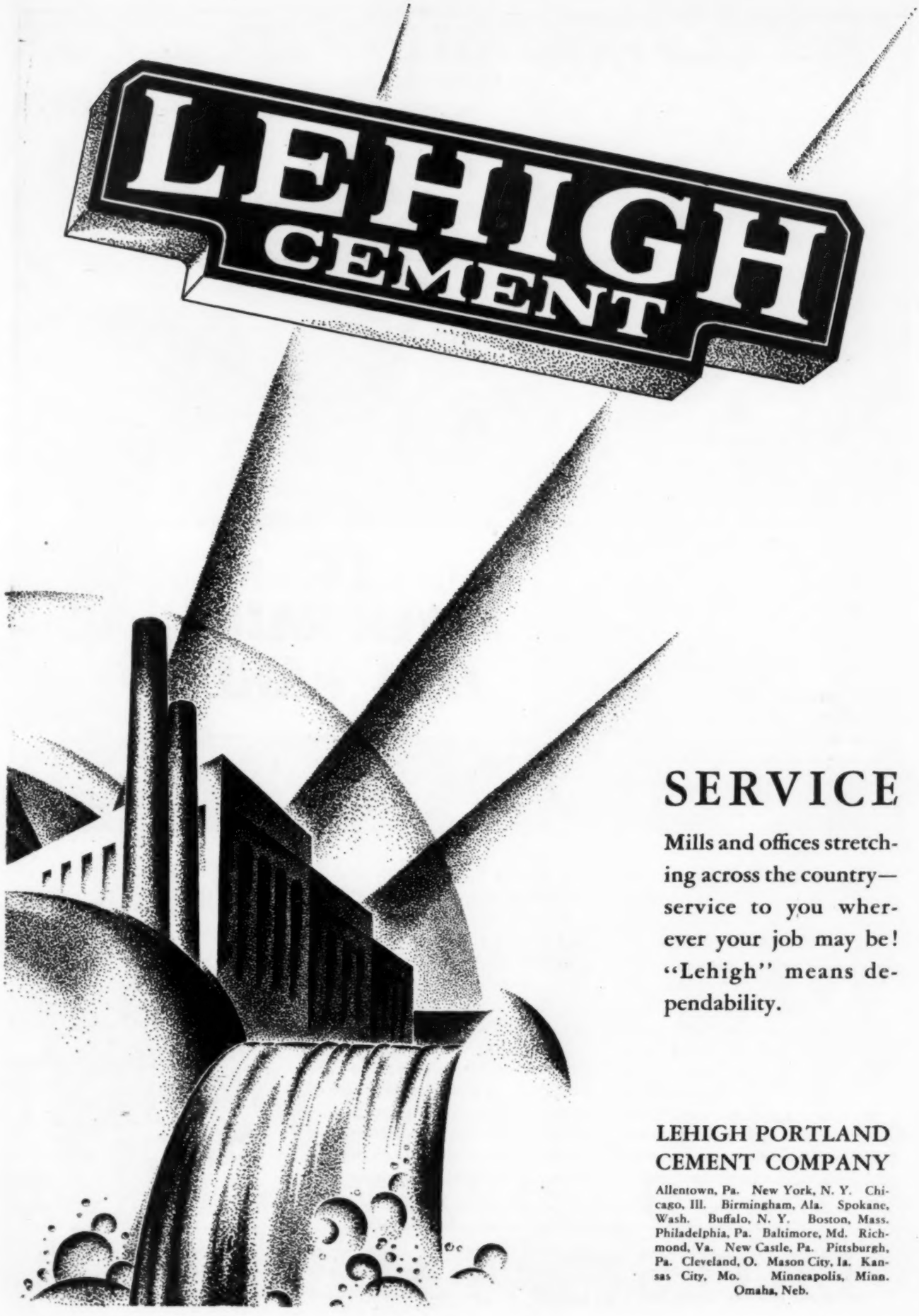
SPECIAL STERLING FEATURES

Self-lubricating bearings
10-spoke wheel
Malleable iron brackets
Smooth wheel face
Wrought steel hub
Riveted and cast to hub spokes
Fixed rolled steel axle
"V" front tray braces
Selected maple handles
Special tubular steel handles
Handles clamped—not bolted
Top of tray reinforced
Channel steel legs
Riveted leg braces
Extra leg shoes
Wrought iron handle tips
All parts interchangeable

STERLING WHEELBARROW COMPANY

STERLING ON A WHEELBARROW MEANS MORE THAN STERLING ON SILVER

Milwaukee Wisconsin



SERVICE

Mills and offices stretching across the country—service to you wherever your job may be! "Lehigh" means dependability.

LEHIGH PORTLAND CEMENT COMPANY

Allentown, Pa. New York, N. Y. Chicago, Ill. Birmingham, Ala. Spokane, Wash. Buffalo, N. Y. Boston, Mass. Philadelphia, Pa. Baltimore, Md. Richmond, Va. New Castle, Pa. Pittsburgh, Pa. Cleveland, O. Mason City, Ia. Kansas City, Mo. Minneapolis, Minn. Omaha, Neb.

THE man with the hose gave this cement-filled Bates Multi-Wall Paper Bag a test far more severe than weather could give it. Yet, even after continued soaking under the heavy hose stream, this bag, chosen at random from a contractor's pile, gallantly demonstrated the strength of Bates Bags' 5-walled resistance to moisture. When the bag was opened, the cement inside was in perfect condition, just as it left the mill.

Protected by Bates Bags, cement and plaster can be delivered on schedule and stored anywhere, in any weather. Your material is safe from moisture and rough handling. Bates Bags prevent loss.

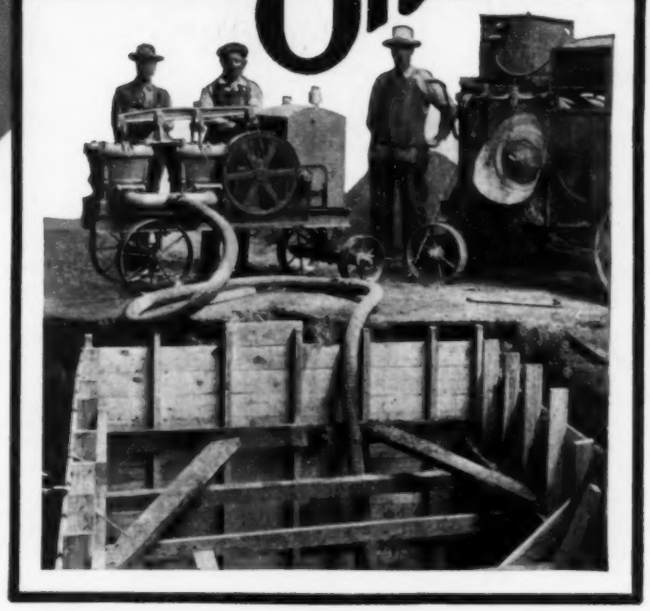
Bates Multi-Wall Paper Bags are made by the Bates Valve Bag Corporation, the inventors and manufacturers of the 5-wall paper bag, in 8 modern plants well located to serve the cement industry. Look for the Bates trade-mark on every bag.

—*no loss*

BATES VALVE BAG CORPORATION
General Offices—35 East Wacker Drive, Chicago, Illinois

BATES Multi-Wall PAPER BAGS

On the Job



HUMPHRYES
940-EDT-4

A typical Humphryes job, draining an excavation for concrete work. Jobs like this are typical of the hundreds of uses that contractors find for Humphryes pumps.

Humphryes Double Diaphragm handles "*more gallons per day*"

ON the job—where the real tests are made—a Humphryes Double Diaphragm quickly proves its claims. "More gallons per day" is more than a slogan when this pump is lifting water.

Shutdowns for repairs are reduced to a minimum. Easily accessible vital parts speed up replacements. The large non-clogging waterway eliminates another cause of troublesome delay.

An exceptionally high capacity without the usual stoppages is a definite assurance of "more gallons per day"

Write today for bulletins describing Humphryes complete line of Contractors' Pumps.

THE HUMPHRYES MANUFACTURING COMPANY
Established 1882
205 East Fifth Street
MANSFIELD, OHIO

HUMPHRYES
CONTRACTORS' PUMPS

UNDERPINNING *a Mountain*

DURING the construction of the Moffat Tunnel, extending six and a half miles through the Rocky Mountains, a point was reached midway between the portals where unprecedented pressures were encountered from 1500 feet of soft rock above. Here was a problem which defied ordinary construction methods and materials.

Concrete made with "INCOR" Cement solved the problem. The high early strength and all-around satisfaction given by "INCOR" Cement under most trying conditions is striking proof of its dependability.

Much is being said these days about high early strength cement. Instead of *claims* about "INCOR", we present the plain facts in the following specification:

Specification for "*Incor*" Cement

"INCOR" Cement is a perfected high-early-strength Portland cement and is guaranteed to conform with all requirements of the Standard Specifications and Tests for Portland Cement of the United States Government and the American Society for Testing Materials. In addition, "INCOR" Cement is guaranteed to exceed the standard specifications in the following items:

Fineness: The residue on a standard 200 sieve shall not exceed 10% by weight.

Tensile Strength: The average tensile strength in pounds per square inch of not less than three standard mortar briquets composed of one part of cement and three parts of standard sand, by weight, shall be equal to or higher than the following:

Age at Test	Storage of Briquets	Tensile Strength lb. per sq. in.
24 hr.	In molds in moist air for 24 hr.	250
48 hr.	(1 day in moist air) (1 day in water)	350

The average tensile strength of standard mortar at 48 hours shall be higher than the strength at 24 hours.

* * *

"*Incor*" Cement saves time—the biggest item of expense in modern industry. And, while saving the owner several times its cost by making possible earlier use and by avoiding costly delays, "*Incor*" assures dependable 24-hour concrete. "*Incor*" *contains no admixtures—it is a perfected high early strength Portland cement.*

"INCOR" Cement

Concrete Tests

Compression tests of 6 x 12-in. cylinders, made in accordance with A. S. T. M. Standards.

Mix 1-4; water ratio .80 (6 gallons per sack of cement.)

Aggregates; sand and pebbles from Long Island, New York.

Cured in moist room at 70° F.; tested damp.

Concrete was mixed in a 3-cu. ft. Wonder Mixer; 14 cylinders were molded from each batch; 2 from each batch were tested at each age.

Cement	Fineness	Concrete Batches	Slump in.	Flow	Concrete Strength lbs. per sq. in.				
					1d	2d	3d	7d	28d
"Incor"	6.1	3	3	180	2300	3400	3840	4650	5190

These tests were made under the direction of Professor D. A. Abrams and are offered as indicating compression strengths that may be expected of concrete when "INCOR" cement is used.

"INCOR" Perfected High Early Strength PORTLAND CEMENT

Made and guaranteed by the Manufacturers of Lone Star Cement

International Cement Corporation
342 Madison Avenue New York

One of the world's largest cement producers—13 mills . . . total annual capacity 20,000,000 barrels

SUBSIDIARIES

ALABAMA PORTLAND CEMENT CO. Birmingham Alabama
INDIANA PORTLAND CEMENT CO. Indianapolis ndiana
THE CUBAN PORTLAND CEMENT CORP. Havana Cuba
LONE STAR CEMENT CO. OF PA. Philadelphia Pennsylvania
THE KANSAS PORTLAND CEMENT CO. Kansas City Missouri
VIRGINIA PORTLAND CEMENT CORP. Norfolk Virginia
KNICKERBOCKER PORTLAND CEMENT CO., Inc. Albany New York
LOUISIANA PORTLAND CEMENT CO. New Orleans Louisiana
ARGENTINE PORTLAND CEMENT CO. Buenos Aires Argentina
TEXAS PORTLAND CEMENT CO. Dallas and Houston Texas
URUGUAY PORTLAND CEMENT CO. Montevideo Uruguay

Starrett accuracy stainless permanence

This combination has produced the ideal tape for outdoor working conditions.

Use the Starrett Stainless Steel Tape wherever there's wet or mud. It does not rust. Simply wipe it off to remove the grit, wind it up and forget it until next time. It always remains bright and clear.

Starrett Stainless Steel Tape No. 521 is graduated in feet, tenths and hundredths of a foot. The No. 520 is graduated in feet, inches and eighths of an inch. Both are made in 50 and 100 feet lengths.

Send for free copy of Starrett Catalog No. 24 "NF."

THE L. S. STARRETT CO.
World's Greatest Toolmakers
Manufacturers of Hacksaws Unexcelled
Steel Tapes—Standard for Accuracy
ATHOL, MASS., U.S.A.

2050

Use Starrett Tools

A Traffic Guard that Never Sleeps

DIETZ Little Wizard Cold Blast Lanterns stay "awake" in all kinds of weather. Thorough dependability and extra lighting power make them insistent guardians of public safety, which likewise reduces the hazard from accident claims.

These important reasons, coupled with favorable price, are putting ever increasing quantities of Dietz Little Wizard Lanterns at work on highway and construction jobs everywhere.

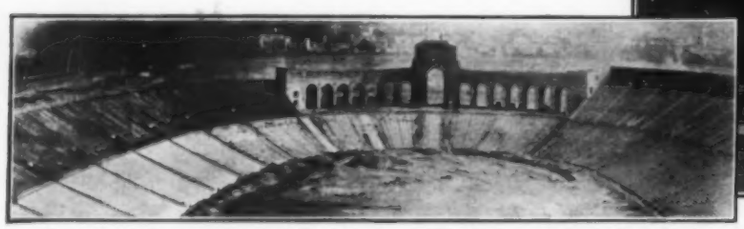
R. E. DIETZ COMPANY
NEW YORK
Largest Makers of Lanterns in the World
FOUNDED 1840

DIETZ LANTERNS

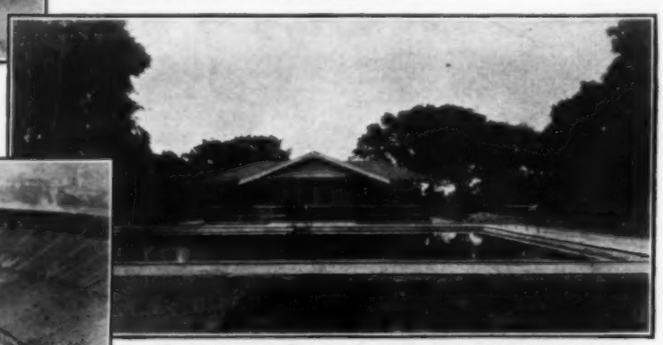
A few of the ways *in which engineers use Carey Elastite Expansion Joint* to protect concrete construction work, *and* to prevent expansion and contraction over-stresses...

A stretch of concrete roadway between Nashville and Murfreesboro, Tennessee, lastingly protected by Carey Elastite Expansion Joint, properly installed at intervals of forty feet.

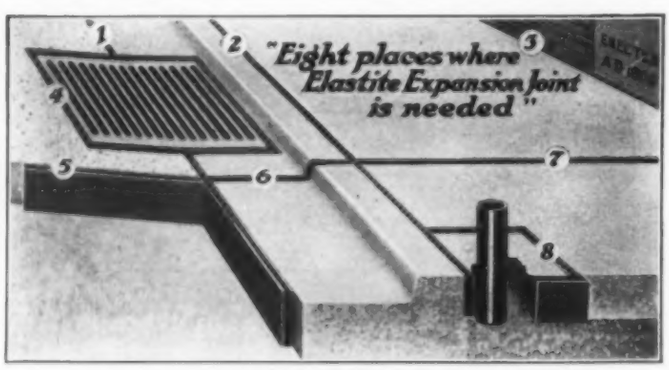
The 1200-ft. Conneaut Viaduct, on the Cleveland-Buffalo Road, Ashtabula County, Ohio. Carey Elastite Expansion Joints were used on both sides of the railing posts.



For the stadium and grandstand . . . . The Coliseum, Exposition Park, Los Angeles, California, protected against over-stresses by Carey Elastite Expansion Joint.



Carey Elastite Expansion Joint is used extensively to protect swimming pools, reservoirs, dams and retaining walls.



Carey Elastite Expansion Joint is used here in eight places—between the pavement and the curb, between the sidewalk and the curb, between the sidewalk and the building, around sewer openings and manholes, transversely in the pavement at 30-ft. intervals, transversely in the curb, transversely in the sidewalk, around all posts and obstructions.

Carey Elastite EXPANSION JOINT

is made of the best and most carefully selected materials—fibrous asphalt, permanently pressured between two layers of asphalt-saturated felt. It meets any expansion joint specifications, anywhere, and it lasts as long as the concrete it protects. Write for particulars about modern methods of expansion joint installation.

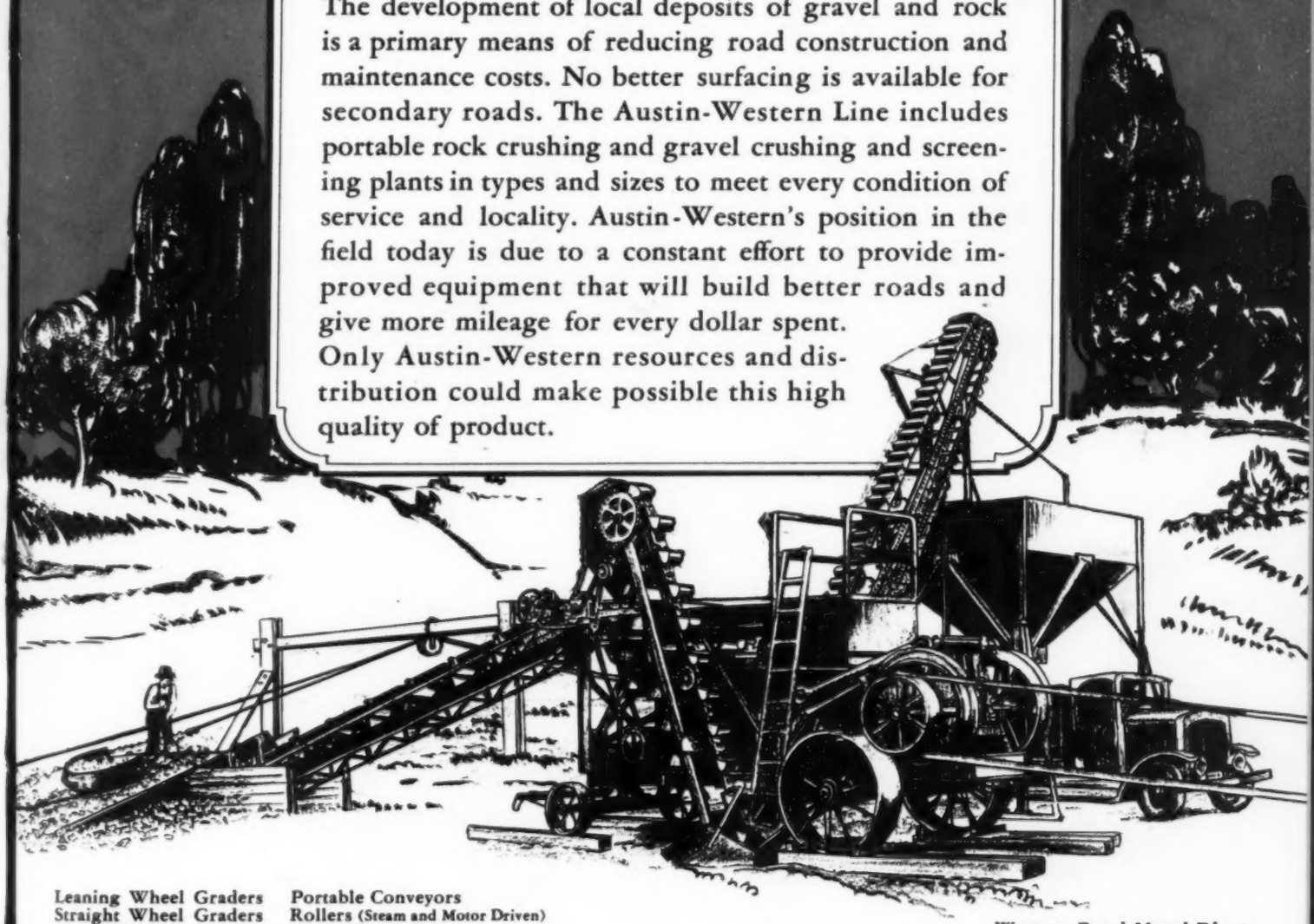
THE PHILIP CAREY COMPANY, *Lockland,* CINCINNATI, OHIO

THE AUSTIN-WESTERN LINE

PORTABLE CRUSHING
AND SCREENING PLANTS

To Better Serve the Field

The development of local deposits of gravel and rock is a primary means of reducing road construction and maintenance costs. No better surfacing is available for secondary roads. The Austin-Western Line includes portable rock crushing and gravel crushing and screening plants in types and sizes to meet every condition of service and locality. Austin-Western's position in the field today is due to a constant effort to provide improved equipment that will build better roads and give more mileage for every dollar spent. Only Austin-Western resources and distribution could make possible this high quality of product.



Western Road Metal Plant with discharge elevator

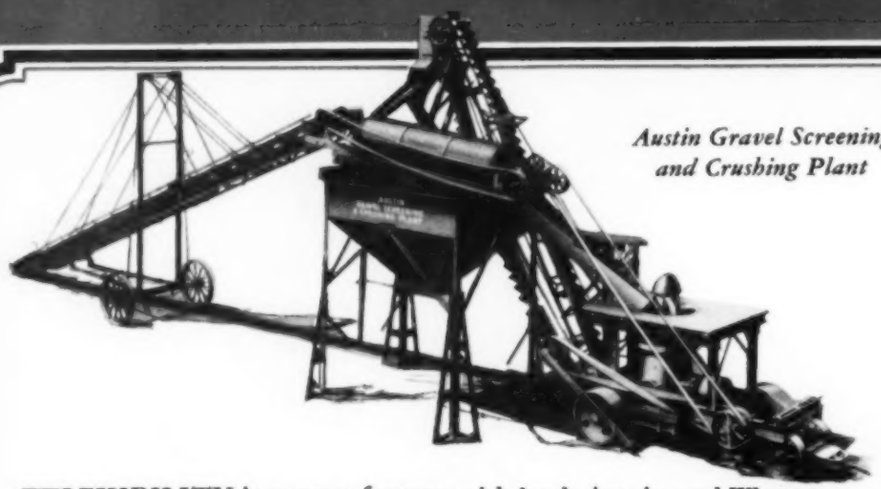
Leaning Wheel Graders	Portable Conveyors
Straight Wheel Graders	Rollers (Steam and Motor Driven)
Motor Graders	Motor Sweepers
Elevating Graders	Street Sweepers
Dump Wagons	Sprinklers—Road Oilers
Crawler Dump Wagons	Corrugated Culverts
Scarifiers	Hot Patch Repair Outfits
Rock Crushers	Plows and Scrapers

Austin-Western
ROAD MACHINERY

"MOST MILES FOR YOUR ROAD DOLLARS"

FLEXIBLE UNIT CRUSHING PLANTS

Adaptable for Service Under All Conditions



Austin Gravel Screening and Crushing Plant

FLEXIBILITY is a great feature with both Austin and Western Portable Crushing Plants. Elevators, screens, bins, feeding conveyors and crushers, whether purchased separately or together, combine to make completely portable crushing plants.

Local conditions vary so greatly that few plants can be set up in exactly the same way. We have for years maintained an engineering force that is at the service of prospective buyers, and working drawings together with bills of material are furnished free with all plants for which we supply equipment.

The Austin Gravel Screening and Crushing Plant, shown above, consists of a portable conveyor; rotary screen which delivers oversized material to the crusher; return elevator from crusher to screen, and all-steel portable bin.

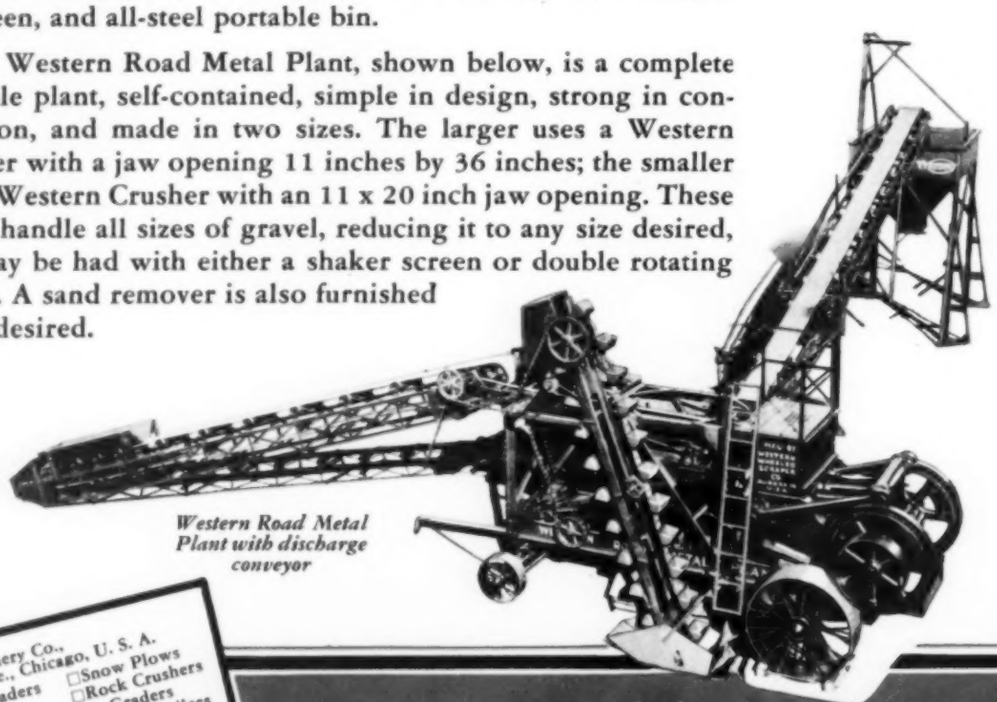
The Western Road Metal Plant, shown below, is a complete portable plant, self-contained, simple in design, strong in construction, and made in two sizes. The larger uses a Western Crusher with a jaw opening 11 inches by 36 inches; the smaller uses a Western Crusher with an 11 x 20 inch jaw opening. These plants handle all sizes of gravel, reducing it to any size desired, and may be had with either a shaker screen or double rotating screen. A sand remover is also furnished when desired.

Austin Gyratory Crusher

Great strength and a pumpless automatic lubricating system are outstanding features of this crusher. The back driving gear is equally as substantial as on the unmounted machine.

Western Jaw Crusher

Simple, all-steel construction gives needed strength without interfering with portability. A double stroke action keeps the jaws always in contact with the stone at some point.



Western Road Metal Plant with discharge conveyor

The Austin-Western Road Machinery Co.,
Dept. 1408 400 N. Michigan Ave., Chicago, U. S. A.

☐Motor Graders ☐Road Graders ☐Snow Plows
☐Rollers ☐Scarifiers ☐Rock Crushers
☐Portable Conveyors ☐Elevating Graders
☐Dump Wagons ☐Street Sweepers ☐Sprinklers ☐Oilers
☐Hot-Patch Repair Outfits ☐Plows and Scrapers

Please send literature and full information on items checked.

Name .....

Address .....

.....

The Austin-Western Road Machinery Co.

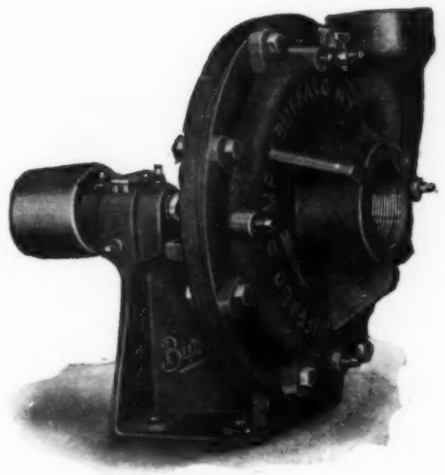
400 North Michigan Avenue
CHICAGO, ILLINOIS, U.S.A.

Branches in Principal Cities

Your PUMPING Problem

Does it come within this range?

10 to 500 Gallons per Minute AGAINST **10 to 120 Foot "Head"**



Driven by belt or direct by electric motor or gas engine

Here's a remarkable line of heavy duty pumps for general utility work. They are being used by contractors, city water departments, industrial plants, electric companies (for pumping out man-holes), etc., etc.! They just fill the bill on hundreds of various pumping jobs. Drive them by belt or direct—or mount them on a light motor truck and drive them with a power take-off. We'll help you solve your problem!

The low prices will surprise you, especially when Buffalo quality is considered. Compared on a gallon for gallon basis, the "CH" Pumps offer the greatest values on the market!

Select your G.P.M. required and "Head" in first two horizontal columns. Find answer below.

G. P. M.	10 to 40	40 to 110	60 to 125	125 to 225	175 to 500
"Head"	10′ to 70′	10′ to 70′	10′ to 100′	10′ to 100′	10′ to 120′
Answer	No. 1 "CH"	No. 1½ "CH"	No. 2 "CH"	No. 2½ "CH"	No. 3 "CH"

If you locate (in the above table) the approximate gallons per minute required and the correct "head," you will find the best answer to your problem in the Buffalo "CH" Pump as specified. For example—if you want to pump 50 G. P. M. against a 25-foot "head," the right pump is the No. 1½ "CH". We will tell you the exact pump speed required to meet the conditions you specify.

Additional details, prompt delivery and service may be had thru our branch offices located in the following cities:—

Atlanta
Boston
Chicago
Charlotte
Cincinnati
Cleveland
Detroit
Indianapolis
Los Angeles
Minneapolis
New Orleans
New York
Omaha
Philadelphia
Pittsburgh
San Francisco
Seattle
St. Louis
Toledo
Washington

Mail today for more information.

Buffalo Steam Pump Co., Buffalo, N. Y.

Please send to .....

Address .....

Complete information on your line of "CH" Pumps. I want to pump — gal. per min. against a head of — ft.

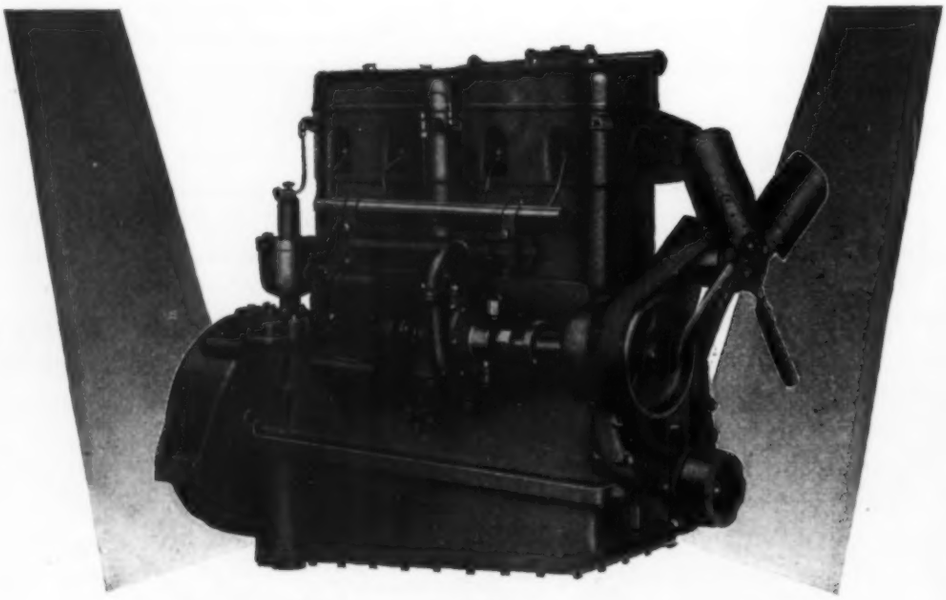
Buffalo Steam Pump Company

183 Mortimer St., Buffalo, N. Y.

"Pump Builders for Half a Century"

In Canada: Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

Over land with SPEED and SURETY! Through night and day alike—miles are minutes — the objective is destination. People travel on schedule — whether the distance be 35 or 3500 miles. Such dependability is assured; it is a credit to man and machinery. . . . . Le Roi power stands for such DEPENDABILITY on construction work. Its position in this field is high and enviable—its performance unparalleled—it boasts of lower maintenance costs —lowest operating costs — consistent performance, day after day. Look to the Le Roi for DEPENDABLE POWER and know it by what it does.



LE ROI COMPANY, Milwaukee, Wis.

LE ROI ENGINES

3 *to* 160 HORSE POWER

Steel Forms
to bridge the Potomac

Blaw-Knox Steel Centering is floated into position on barges.

The Hunkin-Conkey Company find this method of handling to be very economical and efficient.

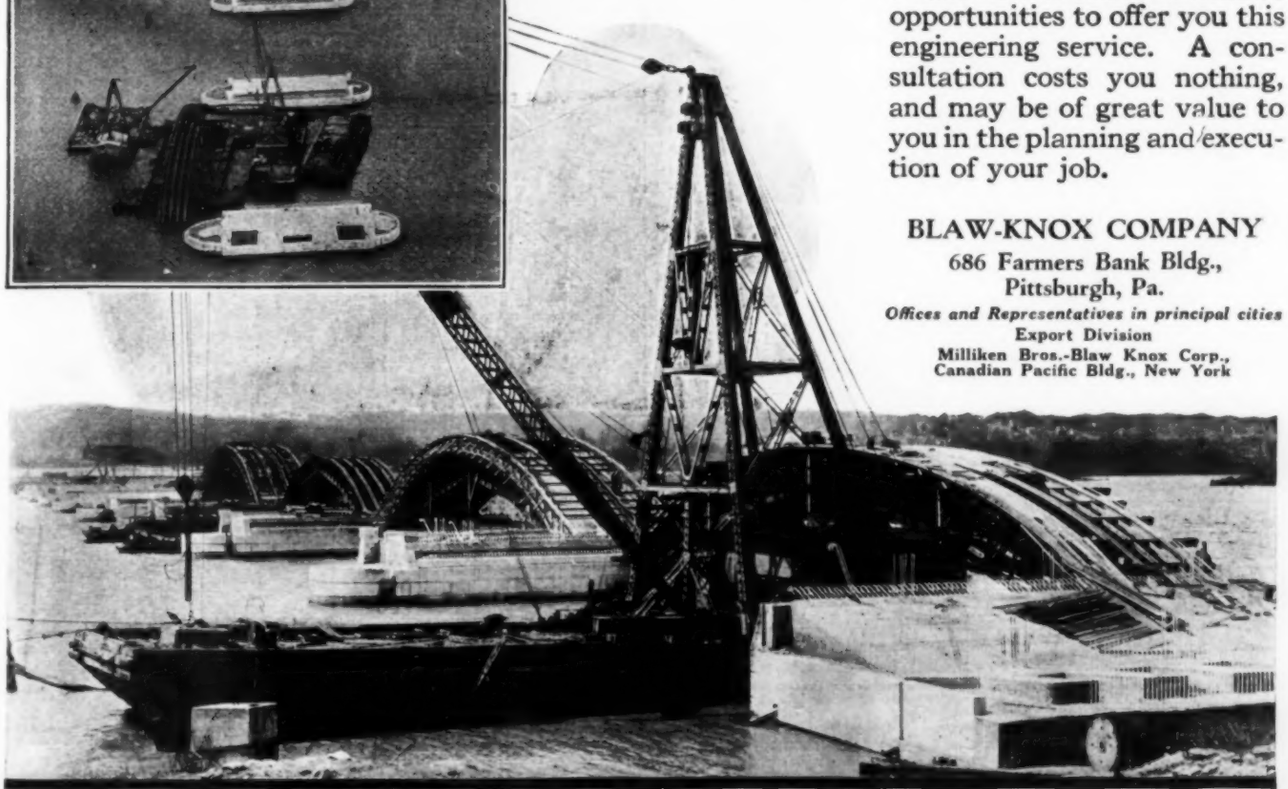
The $10,000,000 Arlington Memorial Bridge at Washington, D. C.— nine long spans of 90 ft. width— is typically a job for Blaw-Knox Steel Centering.

Thirty-six set-ups, four for each span, for which the constant re-use of STEEL FORMS is far more economical and efficient than any other method known to construction.

Before you plan your next job— even before you send in your bid— it will pay you to consult with Blaw-Knox Engineers. They will give you frank and free advice as to whether STEEL FORMS are applicable to the work.

No job is too large; none too small. Blaw-Knox welcomes opportunities to offer you this engineering service. A consultation costs you nothing, and may be of great value to you in the planning and execution of your job.

BLAW-KNOX COMPANY
686 Farmers Bank Bldg.,
Pittsburgh, Pa.
Offices and Representatives in principal cities
Export Division
Milliken Bros.-Blaw Knox Corp.,
Canadian Pacific Bldg., New York



BLAW-KNOX

TRADE BLAW-KNOX MARK

DREADNAUGHT BUCKETS WITH BALL BEARING SHEAVES

ROAD BUILDERS' EQUIPMENT—STEEL FORMS FOR CONCRETE—FORGE AND HAMMER WELDING
STEEL GRATING—CLAMSHELL BUCKETS—STANDARD BUILDINGS—STEEL BINS
STEEL PLANT EQUIPMENT—TRANSMISSION TOWERS—TRACYFIERS

Reversible Ratchet Wrenches

LOWELL

Every Pattern of Wrench Above Finds Its Place In Contractors' Equipment

If we were to print in this column the names of the different contractors of the country who are using LOWELL REVERSIBLE RATCHET WRENCHES

And if we were to print them in type much smaller than this, in fact, so small that you had to use a reading glass to decipher them

Then we would need several such spaces, for the number of contractors who believe in the LOWELL WRENCH is by no means small.

So, if they, in their large number, are a recommendation for this tool, if they find it of advantage to use it in their operations, if they select the LOWELL because,—well, because it's a LOWELL, wouldn't it be worth while sending for a catalog and become acquainted with it?

Just say Catalog M or use the coupon.

A RATCHET WRENCH IS A CONVENIENCE AND A TIME SAVER WHEN COMPARED WITH OTHER TYPES.

.....

LOWELL WRENCH COMPANY

54 Commercial Street

WORCESTER, MASS., U. S. A.

Tear out this coupon on dotted line above, write your name and address below, put it in an addressed envelope and let Uncle Sam and us do the rest.

Send Catalog M.

Name .....

Address .....

City ..... State .....

Company .....

They Tried To Stick It

"The men at this property claim that they have tried, at different times, to stick the H7, but have failed. They certainly have been advertising our H7 to others, stating that the Cleveland H7 is the best all around drill they have ever run."

Which supports our claim for the power, speed and hole cleaning ability of the H7. You can use a super tool like this on any rock drilling or demolition work.

Better find out more about the H7. ***We'll demonstrate on any job you select.***

The Cleveland Rock Drill Co.

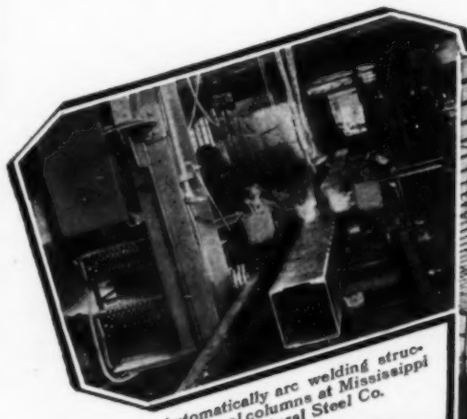
3734 E. 78th St., Cleveland, Ohio

CLEVELAND ROCK DRILLS

THE ARC WELDING AGE

It's coming FAST

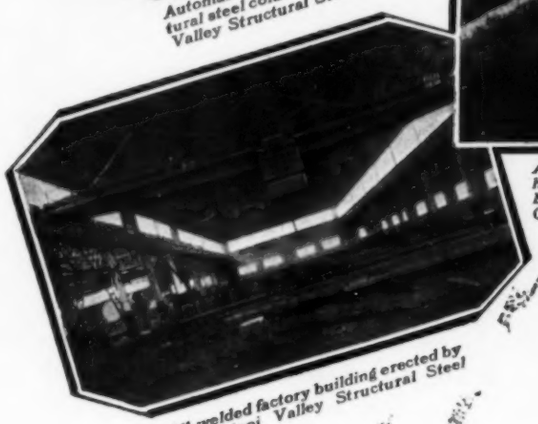
Prepare Now!



Automatically arc welding structural steel columns at Mississippi Valley Structural Steel Co.

All-welded greenhouse erected by E. W. McLellan Co.

Standard mill-type building completely arc welded by Youngstown Welding Co.



All-welded factory building erected by Mississippi Valley Structural Steel Company

America Bridge Co. crew arc welding roof trusses for huge G-E factory building

THE MORE YOU ARC WELD THE MORE YOU SAVE

The experimental stage is passed. Arc Welding is here to stay. To sit back and wait is to lose your position in the field.

Prepare now for the Age of Arc Welding in building construction. Begin studying designs, tests, welding equipment, and costs.

General Electric has unusually complete files of arc welding application and cost data. It manufactures the only complete line of arc welding equipment. And it offers you the most complete service available anywhere. Prepare now by using this service.

530-46

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

The New Line of

Republic

Roller Bearing Mixers

Creates Great Interest

Note these FEATURES

1. Hyatt Roller Bearing equipped throughout.
2. Bigger Drums.
3. Thicker Heads.
4. Heavier Trucks.
5. Higher and Wider Wheels.
6. Simpler Construction.
7. Heat treated steel cut gears running in oil.
8. Short turn trucks.
9. Countershaft eliminated.
10. Chain operated skip-shaft.
11. Automatic Throwout and brake.

To the Simplified Construction, greater strength and durability, better mixing, faster discharge and easier cleaning of the new line of Republic Mixers, Roller Bearing Construction gives added life and reduces power and fuel.

Dealers and jobbers will find the new Republic a fast seller. Some territory still open. ***Write for full information.***

REPUBLIC IRON WORKS
Tecumseh, Mich.

A Complete Line—Tilters, Non-Tilters

All Republic quality and value, completely roller bearing equipped. Sizes 3½-5-7-10 cubic feet capacity.

Republic Iron Works
Tecumseh, Mich.

Please send complete data on your new line of Republic Mixers.

Name .....

Street .....

City .....

Distributor .....

Ask him to help you!

GETTING a construction job is only half the battle. The other half is getting it done—AT A PROFIT.

And getting work done at a profit is becoming more and more a question of knowing *how to plant the job.* The up-to-date construction man — contractor, engineer, superintendent, or foreman—must know thoroughly the equipment, materials and tools of his business.

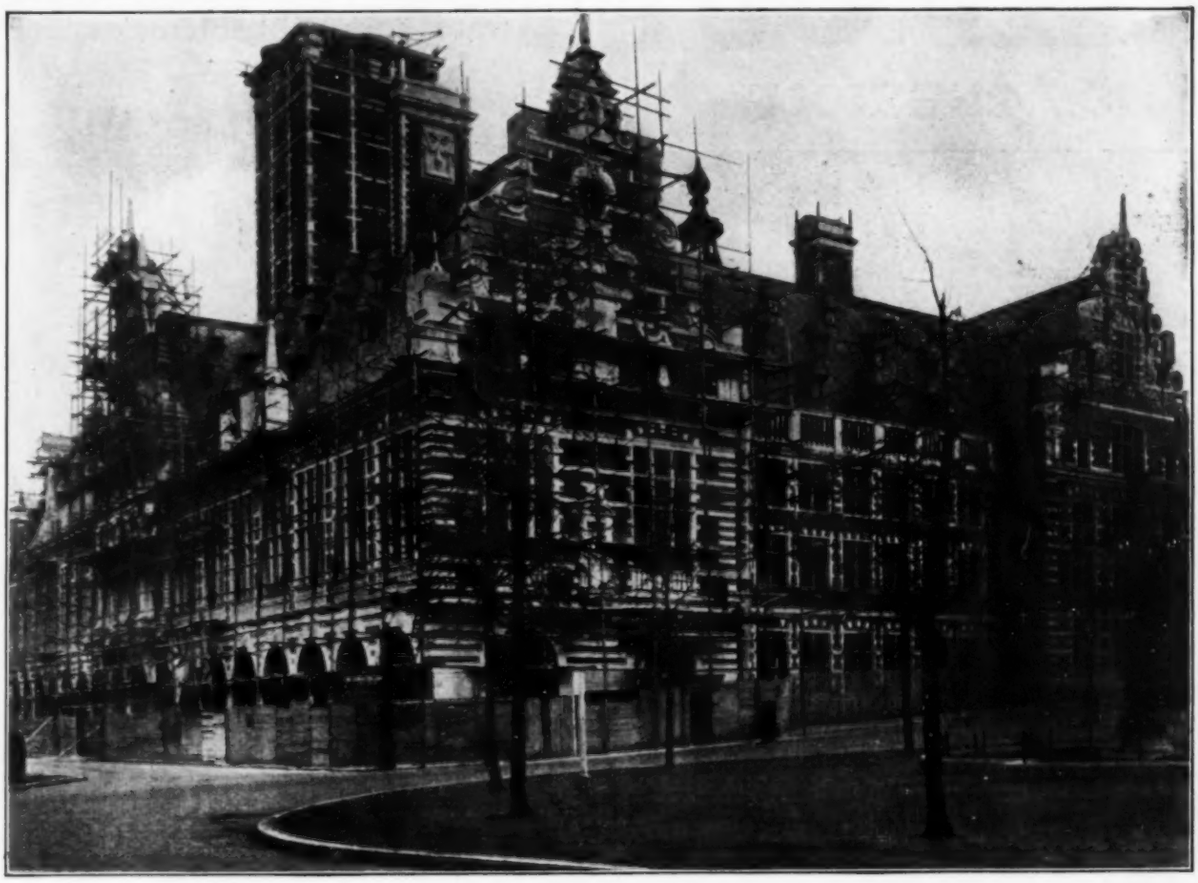
Construction Methods is helping him to do this. Its theme is FIELD METHODS. Its pictures and stories tell him what is new and interesting and helpful about construction methods the world over on all kinds of work.

The ADVERTISING PAGES play a vital part in doing this job. The machinery, equipment and materials that have been developed during recent years are working *a revolution in construction methods.* And new ideas and improvements are coming so fast that **no construction man can afford to lose sight for a minute of what the manufacturers are doing.**

If you want to be up-to-date all the time you must read these advertising pages closely. And if you want the full benefit of what the manufacturer can do to help you—ASK HIM.

He will be glad to show you how he can help you to do MORE work and BETTER work at a LONGER PROFIT.

That is the quickest road to a bigger job or a better business for you. ASK HIM TO HELP YOU!



Louvain University Library — *Louvain, Belgium*

Warren and Wetmore, Architects
The Foundation Company, General Contractors

The promise of restoration to Louvain University of its Library, destroyed at the beginning of the World War, is rapidly reaching its fulfillment. Made possible through the contributions of America's Students and built from the appropriate designs and plans of the Architect, it has been dedicated and will soon be completed. The Foundation Company takes great pride in its share in this achievement.

THE FOUNDATION COMPANY

CITY OF NEW YORK

Office Buildings
Industrial Plants
Warehouses
Railroads and Terminals
Foundations and Underpinning
Filtration and Sewage Plants

ATLANTA
PITTSBURGH
CHICAGO
SAN FRANCISCO

MONTREAL
MEXICO CITY
CARTAGENA, COLOMBIA
LIMA, PERU

LONDON, ENGLAND
PARIS, FRANCE
BRUSSELS, BELGIUM
TOKYO, JAPAN

Hydro-Electric Developments
Power Houses
Highways
River and Harbor Developments
Bridges and Bridge Piers
Mine Shafts and Tunnels

BUILDERS OF SUPERSTRUCTURES AS WELL AS SUBSTRUCTURES

KEEP OUT

OF THE HOLE

Have you ever considered accidents in terms of production cost . . . ?

Follow the example of many thousands of contractors, state and county highway departments, public utilities, etc., who have made themselves safe from this danger

by using

THE TOLEDO TORCH

PAT. JAN. 11 1927

RIGHTS ITSELF FROM ANY POSITION

it is

Unbreakable · Storm-proof
Economical · Theft-proof
Endorsed by Insurance Co's.

Sold by principal dealers everywhere

Direct inquiries answered with complete information and a useful souvenir

The Toledo Pressed Steel Co.
12th and Woodruff Toledo, Ohio

To make your unwatering and water supply problems easier!

THIS Morris Portable All-Purpose Pump handles anything from clear water to floating dirt, sand and gravel, delivers 300 to 600 gals. per min., can be used for heads up to 50 ft., and is easy to cart from one job to another. For general water supply, unwatering excavations, sumps, etc., it can't be beat.

Write for literature about this and other sizes of Morris Pumps

MORRIS MACHINE WORKS, Baldwinsville, N.Y.

MORRIS
CENTRIFUGAL PUMPS

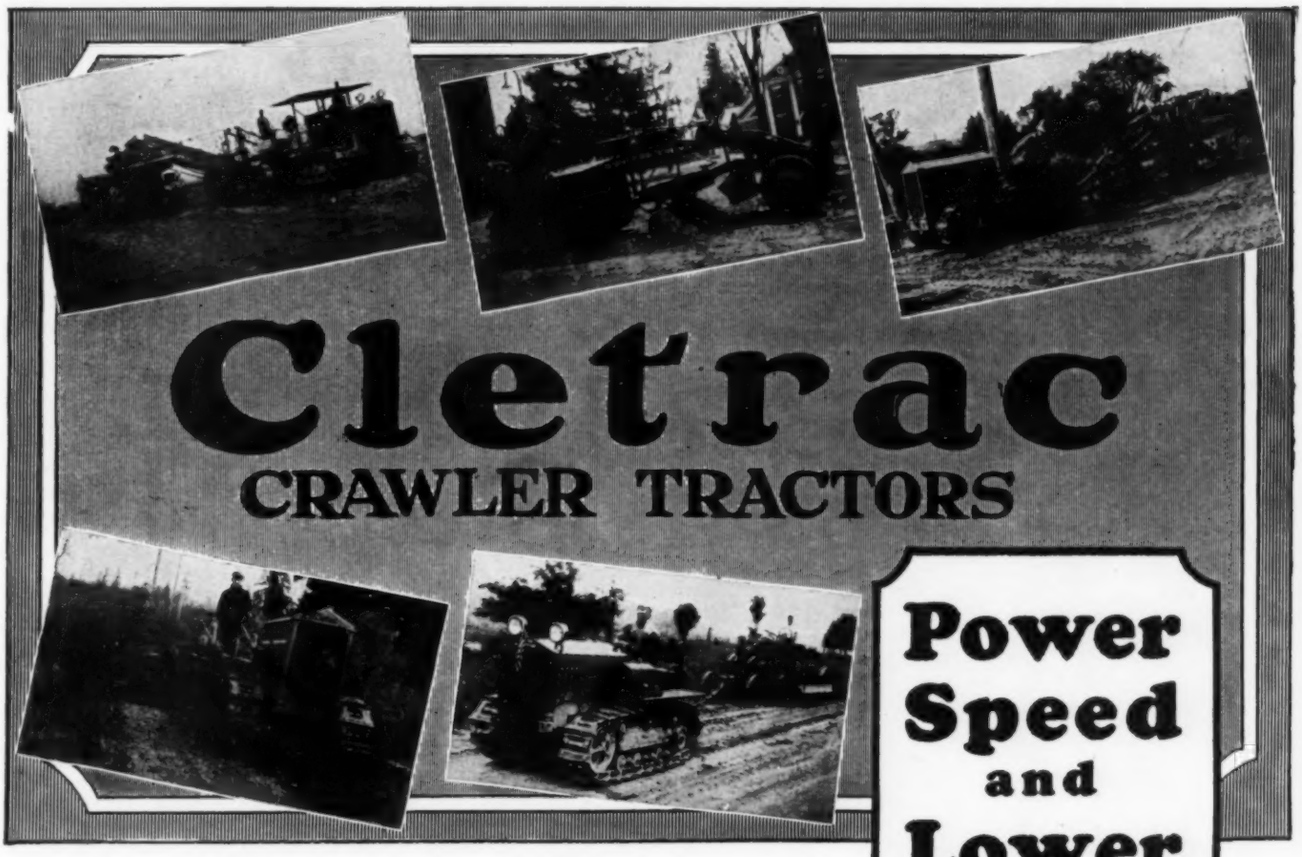
Water

The Least of Your Troubles with a Barnes Pump

You, too, as many other experienced contractors have done, can turn the water supply "bugbear" into a negligible item. Rugged Barnes Triplex Road Pumps are heavily designed to give maximum service at minimum cost. These features are some of the reasons:

1. Most simple, self-oiling system—one moving part rotary pump.
2. All steel gears.
3. Forged crankshaft—not cast.
4. Three point suspension truck, spring mounted.
5. Roller bearings on all shafts, including crankshaft.
6. Water cylinders detachable from power end.
7. Flexible coupling between pump and engine.
8. Rubber tired roller bearing wheels, interchangeable with standard steel wheels.

THE BARNES MANUFACTURING CO.
923 Main Street, Mansfield, Ohio



Cletrac
CRAWLER TRACTORS

Power Speed and Lower Costs

CLETRAC Crawler Tractors make possible very definite reductions of costs in road work, earth-moving, excavating and similar operations. The reasons are obvious, once you have seen Cletrac in action.

Cletracs require no "time out" for oiling or attention during the day. They move and maneuver with a work-eating speed that cuts time to a minimum. They operate, "rain or shine" with the same sure-footed traction and efficiency. They turn easily in close quarters and pull tremendous loads. Their oil and gas consumption is remarkably low. They are built to outlast ordinary tractors. *From the standpoint of economy, performance or profit, you can't beat Cletrac.*

Cletrac Crawler Tractors

Write or mail the coupon for the facts about the complete Cletrac line.

The Cleveland Tractor Company
Cleveland, Ohio

Mail the coupon for the interesting story of Cletracs in road work!

THE CLEVELAND TRACTOR CO.,
Cleveland, Ohio.
Send literature regarding Cletracs for highway and industrial work.
C.M.

Name_____

Address_____

This College Is Waterproofed with "ANTI-HYDRO"

The concrete foundation walls and basement floors in the Music Building and many others comprising the North Carolina College for Women are waterproofed with "ANTI-HYDRO."

These buildings were not all erected at the same time. But after once using "ANTI-HYDRO" results were so satisfactory that "ANTI-HYDRO" was used in all later buildings.

"ANTI-HYDRO" has so thoroughly and permanently waterproofed the concrete foundations that the rooms below grade are absolutely dry and usable at all times.

"ANTI-HYDRO" is dependable, economical and extremely easy to use. It is a liquid integral compound, which when added to the mixing water makes concrete permanently hard and waterproof *in one operation.*

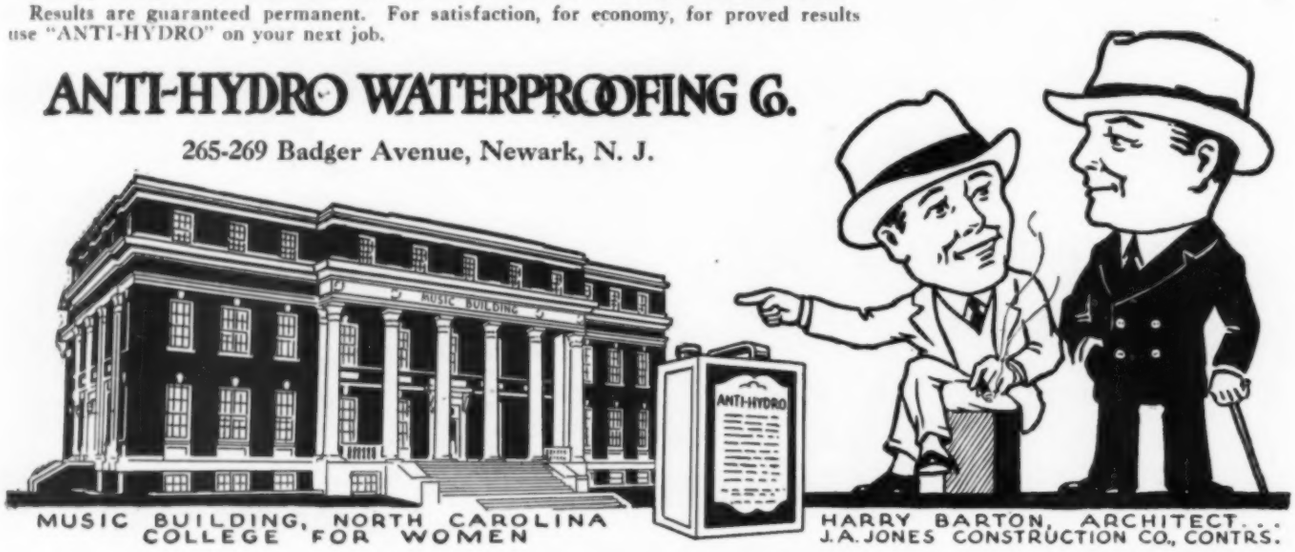
Twenty-four years of continuous use have taken all the doubt out of "ANTI-HYDRO."

Results are guaranteed permanent. For satisfaction, for economy, for proved results use "ANTI-HYDRO" on your next job.

"ANTI-HYDRO" FOR PERMANENT CONCRETE
HARDENS WATERPROOFS

ANTI-HYDRO WATERPROOFING Co.

265-269 Badger Avenue, Newark, N. J.



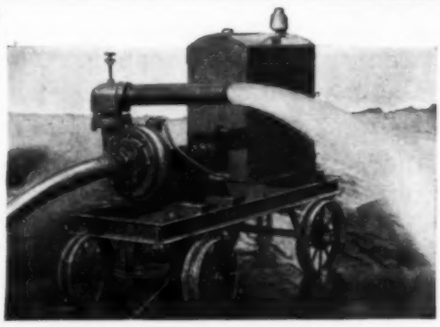
MUSIC BUILDING, NORTH CAROLINA COLLEGE FOR WOMEN

HARRY BARTON, ARCHITECT...
J.A. JONES CONSTRUCTION CO., CONTRS.

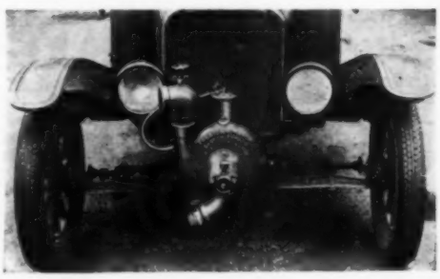
Both Automatically Primed to Abolish Costly Delays

NO TIME lost, if you've got American-Marsh pumps on the job. Less than one minute after you start up, you're handling water—full capacity. No hand priming. Every American-Marsh pump has our automatic primer, priming and repriming the pump without any attention—without any costly delays.

Such outfits as New York Bell Telephone Co., Ford Motor, Standard Oil, Great Western Power Co., etc., are cutting costs with our pumps. Why not you? The coupon brings full details.



1—Type MEP Centrifugal Pump



2—Barton Centrifugal Pump

1 Type MEP Centrifugal Pump—Automatically Primed. Furnished complete with LeRoi engine. Built to stand the gaff of continuous service, yet light weight. Six sizes; capacities to 1,200 g.p.m.; suction lifts to 20 ft. Low priced.

2 Barton Centrifugal Pump—Automatically Primed. Attaches to front of any car or truck and automobile engine drives it. Dependable; light weight; does not interfere with driving. Five sizes; capacities to 900 g.p.m.; suction lifts to 20 ft. Low priced.

AMERICAN STEAM PUMP COMPANY
BATTLE CREEK, MICHIGAN.

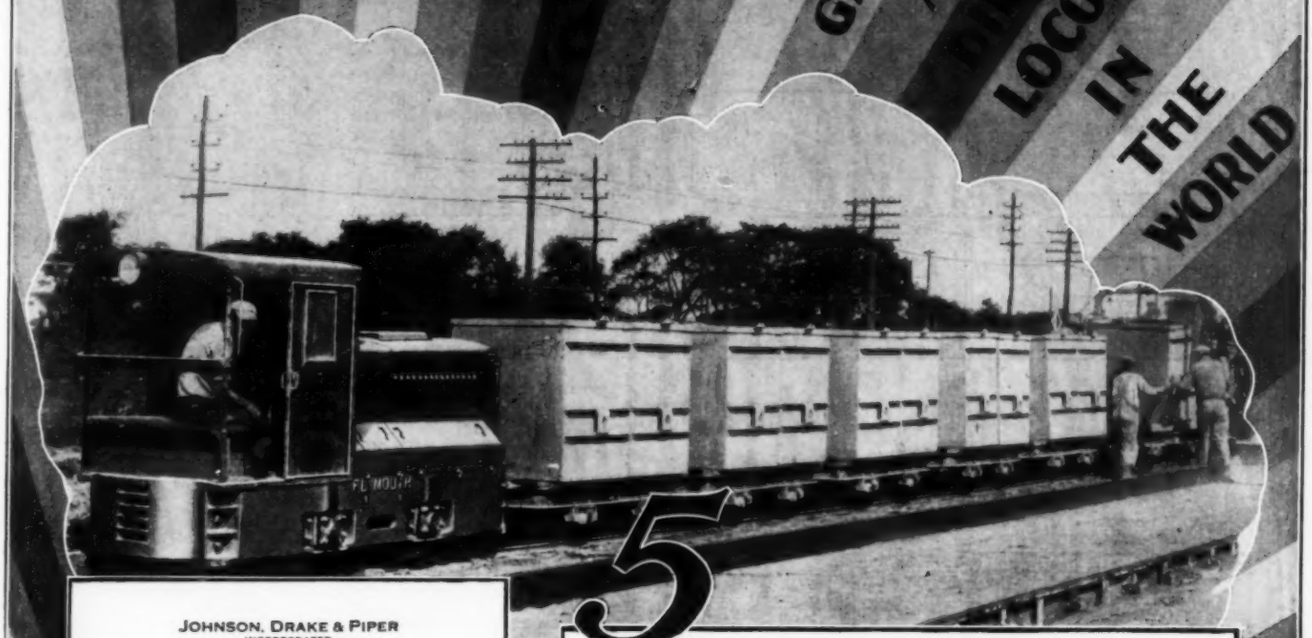
☐ Send Bulletin 59 on Type MEP Pumps.
☐ Send Bulletin 56 on Barton Pumps.

Name .....

Address .....

AMERICAN-MARSH
Contractors Pumps

ONE DOMINANT PURPOSE—BUILD THE BEST GASOLINE AND DIESEL LOCOMOTIVES IN THE WORLD



JOHNSON, DRAKE & PIPER
INCORPORATED
GENERAL CONTRACTORS
MINNEAPOLIS

February 29, 1928

The Fate-Root-Heath Company,
Plymouth, Ohio.
Gentlemen:

On the construction of the Conduit Boulevard, between Rosedale and Amityville, Long Island, we have been keeping two 27E Mixers working to capacity with our five 8-ton Plymouth locomotives.

One of these locomotives is being used as a yard switch engine making up trains, the other four handling twelve to fourteen loaded cars per trip on a maximum haul of 2 1/2 miles. Our heaviest grade is 2 per cent and the locomotives have no difficulty in handling 600 tons of material a day, with a maximum gasoline consumption of twenty gallons for an eleven hour day.

Very truly yours.
JOHNSON, DRAKE & PIPER, INC.

By

5

PLYMOUTHS Keep the Mixers Busy

For Johnson, Drake & Piper, Inc. on the construction of the Conduit Boulevard, between Rosedale and Amityville, Nassau County, Long Island.

Keeping the mixers busy—that's real satisfaction—it's more than satisfaction, it's the key to profits. There is no better insurance against wet season losses than track haulage and Plymouths.

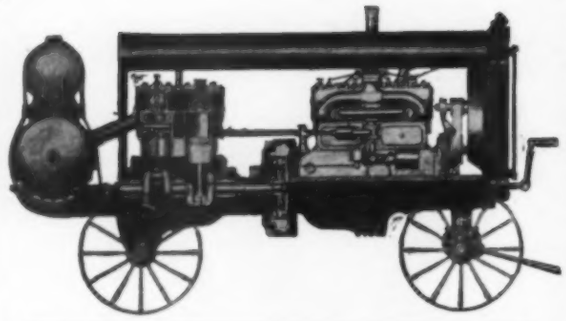
If you have a long paving job or an important time limit contract, now is the time to check into track haulage and its advantages—Why gamble the profits of a good contract on uncertain weather?

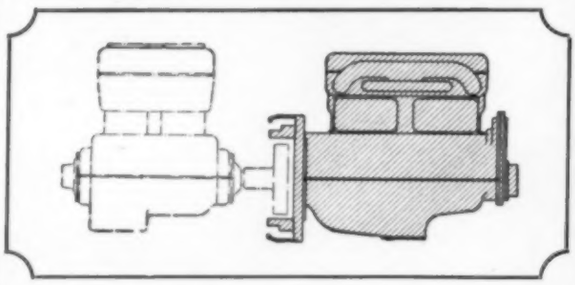
Steel rails and sturdy Plymouths running faithfully to the mixers give you that grand and glorious feeling—especially in soggy weather.

PLYMOUTH LOCOMOTIVE WORKS
The Fate-Root-Heath Company
299 Riggs Avenue
PLYMOUTH, OHIO

GASOLINE PLYMOUTH LOCOMOTIVES DIESEL

PLYMOUTH
GASOLINE *Locomotives* DIESEL





Engine starts without compressor load!

Why Schramm is preferred

1. Operated by vertical cylinder heavy duty Buda Engines.
2. Compressor parts are interchangeable.
3. Greater capacity per dollar invested.
4. Heavy-duty self aligning Clutch.
5. Engine starts without compressor load.
6. Visible Gasoline Strainer.

WHEN you crank the ordinary Portable Compressor engine with the solid coupling, both engine and compressor must be turned over in starting. Think of the effort required —especially in cold weather when the oil is stiff and hard.

No such starting trouble with the Schramm. Note the sketch above of the Schramm Clutch Coupling. You can start the Schramm engine separately, and get it warmed up for full load operation before taking the compressor or air load.

Look over the other features of the Schramm listed here and send for the 1928 Schramm Catalog.

SCHRAMM, INC.
West Chester, Pa.

Offices and Representatives in all Important Cities

Schramm

A Home Run
in Concrete Breakers

The New Sullivan Buster is Ready

Here's the new "K-3" Buster—ready to make money for you.

"K-3" was designed especially in speed and blow for removing concrete. It cuts concrete much faster—yet uses less air than previous models.

"K-3" is powerful, rugged, but easy to handle. With its push throttle control you hold it against the work and it goes; release the pressure and it stops.

"K-3" is built on straight lines with no projections to interfere with the operator. Let us put one on trial on your job.

SEND FOR THE CATALOG 7281-U

SULLIVAN

SULLIVAN MACHINERY COMPANY
168 S. Michigan Ave.
Chicago

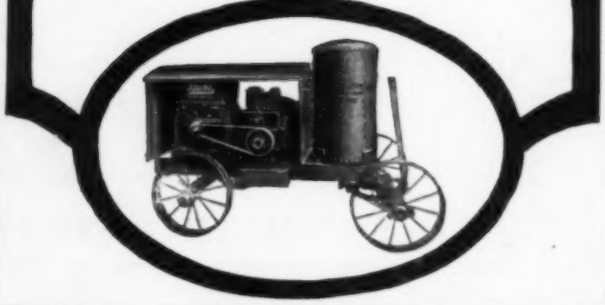
Buhl
AIR COMPRESSORS

Below is illustrated the BUHL Type C Portable Compressor—one of the many different types of this popular line. Moderate in original cost and low in upkeep.

There are six sizes of portable air compressors in the BUHL line to choose from. For operating jack hammers, riveters, clay spades, concrete breakers, etc. The BUHL gives dependable air power at low cost—send for bulletins today.

Sales offices in principal cities

THE BUHL COMPANY
Manufacturers
37 W. Van Buren St., CHICAGO



Car to truck
where bucket speed is essential

IN HANDLING crushed rock from gondola car to auto truck a considerable part of total loading time is consumed in the digging and dumping of the bucket. As a result, a speedy bucket greatly reduces the cost of handling the material.

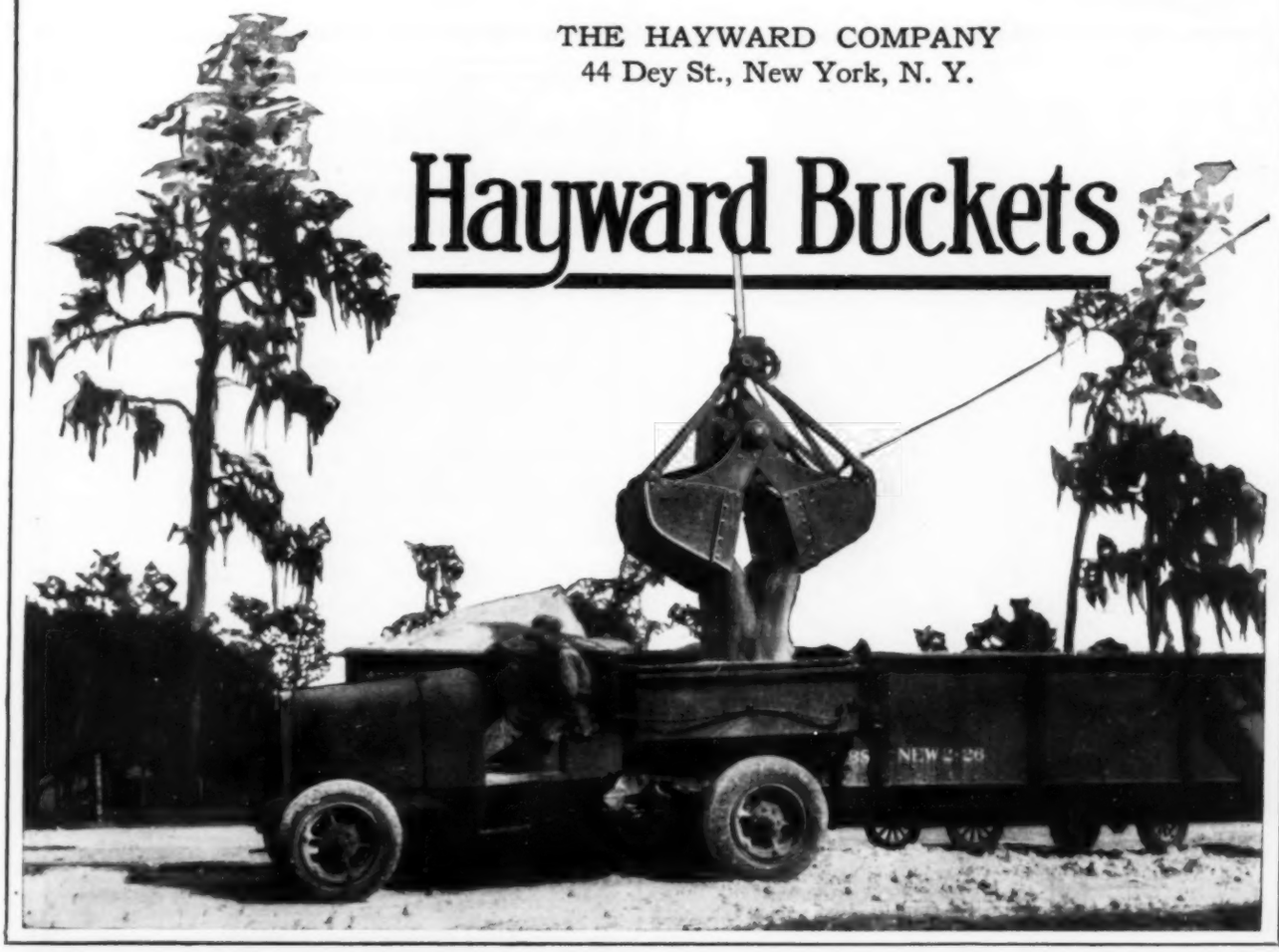
A case in point is the job shown here. The equipment illustrated is that of the Duval Engineering Company in Florida unloading limestone rock. This Class "E" Clam Shell is fast in digging and in dumping. *Accurate*, too! Haywards are easily controlled—require no special operating skill even in loading a small truck.

This bucket, like every other Hayward, is "fitted to the job." Call in a Hayward engineer to assist you in selecting from the diversified Hayward line the proper type of bucket for your next job.

Builders of Clam Shell, Orange Peel, Drag Line and Electric Motor buckets; Dredging, Excavating and Coal Handling Machinery, Automatic Take-Up Reels; Counterweight Drums.

THE HAYWARD COMPANY
44 Dey St., New York, N. Y.

Hayward Buckets



"It equals 7 wagons, 7 teams and 8 men"

Hauling a 7-yard crawler dump wagon on a road job at Baroda, Michigan, this Model 40 Bates Tractor is doing a job that illustrates the great saving in the use of BATES Tractors. With this outfit and two men as much dirt is being hauled and dumped as is being done by another outfit on this same job, consisting of 7 wagons with teams, and 8 men. On an 800 ft. haul the BATES is making over 50 trips a day.

Due to their greater crawler surface on the ground, BATES tractors develop a greater drawbar pull than any tractor of their weight. Rugged construction, great reserve power, and fuel saving due to the Riccardo head motor, are a few of the features that have made friends for BATES machines.

BATES MANUFACTURING COMPANY

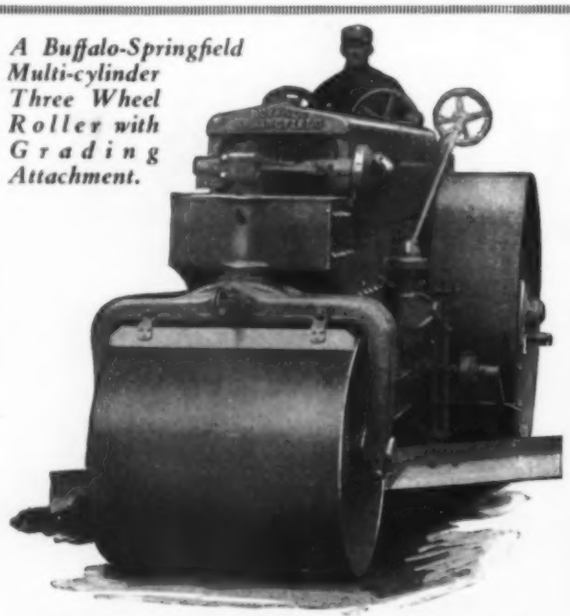
Joliet, Illinois, U. S. A.

3 Sizes

BATES 28 BATES 40
BATES 70

BATES *Tractors*

A Buffalo-Springfield Multi-cylinder Three Wheel Roller with Grading Attachment.



Buffalo-Springfield

jobs are designed to meet all sorts of conditions and are built in many models and sizes. Scarifiers and other special attachments optional. Write.

The Buffalo-Springfield Roller Co.
Springfield, Ohio

Moving Earth at a Saving of 40c on the Dollar

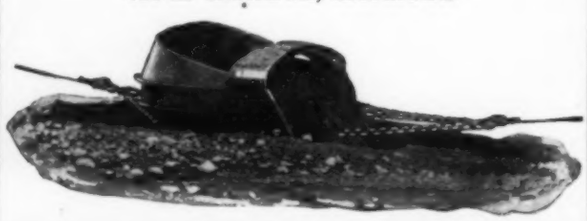
Sauerman Power Scrapers are saving many dollars for the contractor. A Sauerman Power Scraper can do the combined work of excavating and conveying equipment and the investment is much less. The operating costs are equally low, and your payroll amounts to that of one man—the operator.

It works in wet, sticky or dry materials. It can reach out and dig across the area 500 ft. or more in width, moving the materials from cut to fill at the rate of 30 to 50 loads per hour.

One superintendent of a large construction company writes: "Our costs per cu. yd. of materials excavated on 3 jobs where we have used a Sauerman Power Scraper average over 40% lower than our costs on similar work before we had this machine."

Send for Catalog No. 10. See for yourself how costs can be cut.

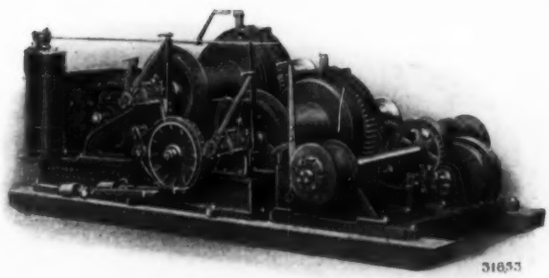
SAUERMAN BROS., Inc.
480 S. Clinton St., CHICAGO



---and we *must have* Hoists of proved ability!

Hard headed, close fisted, experienced engineers and contractors select *dependable* equipment—particularly hoists, cranes or derricks. Purchase price is a secondary consideration. Such men buy Lambert. It was Lambert Hoists that lifted the 144-ton truss for the Paramount Building, 110 feet above the street. It was Lambert Equipment that Raymond selected for the great 5-mile Pontchartrain Bridge, finished 3½ months ahead of schedule!

The Lambert reputation for workmanship, for dependability, for service from the equipment and service *behind* it, has been jealously upheld for 40 years. When *you* buy from Lambert you buy the results of experience on big work. And you get real service—service that extends even to repairing the *hoists* of other manufacturers.



LAMBERT

THE **HOISTS** EXPERIENCED CONTRACTORS BUY

You will send this coupon if

***you appreciate that a well built* hoist, crane or derrick will operate *more economically, last longer,* need fewer repairs and have far greater *resale* value than one bought on *price.* As a shrewd buyer you know this is true—it only remains, then, to use this convenient coupon to get the latest data on *Lambert*.....**

LAMBERT HOISTING ENGINE CO.
117 Poinier St., Newark, N. J.

I am interested in dependable and economical hoists ☐ derricks ☐ cranes ☐ (Check one wanted.) Kindly send me information on the latest designs and show me how they will save me money.

Name.....

Address.....

BROWNING

A Browning Crawler Crane on an excavating job in California.

SPEED in handling, ease in manoeuvering, economy in operation and a long life of service—that sums up the major points of Browning performance. For more productive work use a Browning—it will pay you in dollars and cents on any handling job.

THE BROWNING CRANE COMPANY
16226 Waterloo Road
CLEVELAND, OHIO, U. S. A.
New York : Chicago : Pittsburgh : Birmingham

SALES AGENTS:
Jacksonville : Los Angeles : New Orleans : Baltimore
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STEAM – GAS – ELECTRIC
LOCOMOTIVE – TRUCK – CRAWLER – CRANES

Pay Roll Savers

Baker Maneys taking some big loads.

BAKER MANEY
Self Loading Scrapers

With a pay-roll of only two or three men, you can move as high as 500 to 600 yards a day with a full train of Baker Maney Scrapers. Powerful—easily operated—short turning, they are practical excavators with a long and successful record.

Write for Bulletin No. 251

The Baker Manufacturing Co.
568 Stanford Ave., Springfield, Ill., U. S. A.

IRON MULE
The Original 2 Yard Tractor Dump

H. MILLER & SONS, Iowa have just bought four more Hughes-Keenan "Iron Mules," the complete 2-yd. short haul gravity dump units that are now powered by McCormick-Deering Tractor. Eight units of their ten original "Iron Mules" ran rings 'round 16 three-up wagons. Where the wagons with only 1¼ yd. loads stalled —the "Iron Mules" with crowned load of 2½ yds. kept humping right along.

When a contractor has tested a fleet out on 2,000,000 yds. and—orders 4 more—well, that's real testimony!

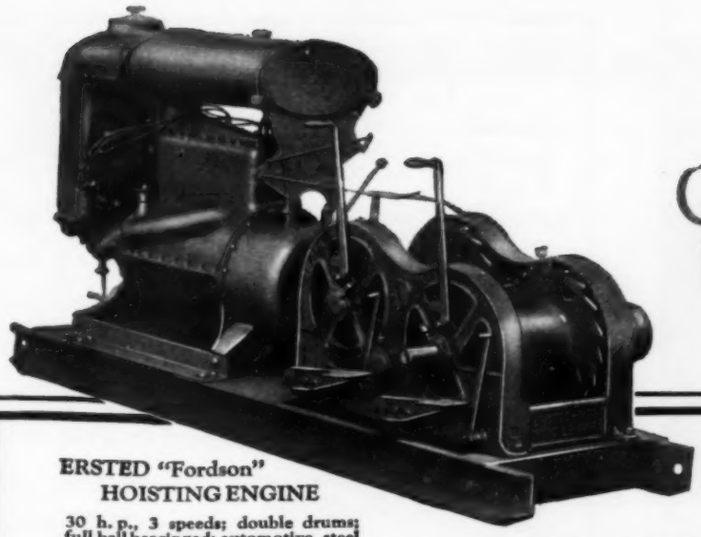
Write for Information, nearest distributor, and contractor near you who is using Iron Mules.

The Hughes-Keenan Co., Mansfield, Ohio

HUGHES-KEENAN
Steel Dump Bodies

ERSTED Automotive HOISTS

3 SPEED BALL BEARINGED



ERSTED "Fordson" HOISTING ENGINE

30 h. p., 3 speeds; double drums; full ball bearinged; automotive, steel construction; capacity to 5000 lbs., weighs only 2400 lbs!

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BALTIMORE, MD.
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BOSTON, MASS.
Clark-Wilcox Co., Inc.
BUFFALO, N. Y.
Wheeler-Murray Company
CHICAGO, ILL.
Western Contractors Sup. Co.
CLEVELAND, OHIO
W. M. Pattison Supply Co.
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Browning-Ferris Machy. Co.
DENVER, COLO.
H. W. Moore Equipment Co.
DES MOINES, IOWA
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W. H. Anderson Tl. & Sup. Co.
EL PASO, TEXAS
Steel Products Corporation
GRAND RAPIDS, MICH.
W. H. Anderson Tl. & Sup. Co.
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Browning-Ferris Machy. Co.
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VANCOUVER, B. C.
National Machinery Co., Ltd.
WASHINGTON, D. C.
Henry H. Meyer Company

WORTH MORE *than Ordinary Hoists!*

COST *LESS* *than Ordinary Hoists!*

ERSTED engineers, first to adapt automotive engineering practices, automotive materials and automotive methods of standardized quantity production to the manufacture of hoisting machinery, left the beaten path and inaugurated a new era in a field in which little progress had been made for twenty years.

Ersted "Automotive" Hoists and Cranes are termed "Automotive" to differentiate them from ordinary hoisting machines. Built into them are capacity and strength, serviceability and efficiency impossible to achieve with ordinary materials and construction. Correct design, superior materials and workmanship combine to make these the most serviceable hoisting machines ever produced; low prices made possible by modern manufacturing methods; the best values ever produced.

More than 5000 Ersted hoist users the world over are testimonial of Ersted acceptance and performance.

Write today for catalog

ERSTED MANUFACTURING CO.
PORTLAND OREGON, U. S. A.

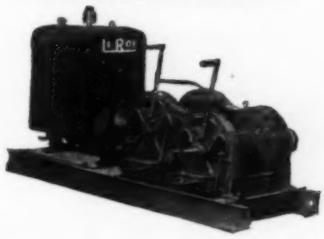
ERSTED *"Automotive"* CRANE

3 speeds; full ball bearinged; automotive, steel construction; for truck or stationary mounting. Capacity, ½ yd. clamshell bucket. *Worth more, cost less than ordinary cranes!*

Write for catalog

ERSTED "Le Roi" HOISTING ENGINE

20 h. p.; 3 speeds, double drum; full ball bearinged; automotive, steel construction; capacity to 5000 lbs; weighs only 2000 lbs!



1

To help you determine

the amount of labor required for the various building operations——

To furnish you

with prices of labor and materials useful in checking estimates ——Frank E. Barnes, Building Valuation Engineer of the New York Central Lines, has revised his widely-known handbook on estimating for builders and contractors——

New Second Edition

ESTIMATING BUILDING COSTS

By Frank E. Barnes

Building Valuation Engineer of the New York Central Lines.

592 pages, pocket size, flexible, illustrated, $5.00 net, postpaid.

FROM excavation and foundation work right through to the wiring and painting of the finished buildings, the book gives exactly the information needed to insure safety in the estimate. It tells you how to calculate the cost of materials, of labor, of haulage, of overhead, of equipment, etc. It gives valuable information on installations and material strengths. Look up in the New Edition the new chapters on Retail Store Fronts, and on Concrete and Structural Steel.

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XIII. Furring, Lathing and Plastering.
XIV. Fire Doors and Windows.
XV. Roofing and Sheet Metal.
XVI. Marble, Tile and Terrazzo.
XVII. Special Flooring.
XVIII. Painting.
XIX. Glass and Glazing.
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XXI. Metal Store Fronts.
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FREE EXAMINATION COUPON

McGraw-Hill Book Co., Inc., 370 Seventh Avenue, New York.

You may send me on 10 days' approval **Barnes' Estimating Building Costs, 2d Edition, $5.00 net, postpaid.** I agree to remit for the book or return it postpaid within 10 days of receipt.

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Use it also as
Trench Hoe
Clamshell
Backfiller
Dragline
Crane

One Man
Gasoline
Shovel or Hoe

FUNDOM SHOVEL
Wizard of Modern Diggers

Full ¾ circle swing. ⅛ yard dipper water level. 16½ ft. radius with boom at 45°. Alemite lubrication. Highest class construction. Fast, powerful, rugged, efficient. Powered by a Fordson. Furnished with regular dipper bucket or with trench hoe or with boom extension.

Write us for information and name of nearest dealer.

The Fundom Hoist & Shovel Co.
407 American Bank Bldg., Lima, Ohio

Used and Surplus Equipment

INDIVIDUAL items of used equipment, or surplus new equipment, or complete plants, are disposed of (and found) through advertising in the *Searchlight* Section of this paper.

This is the section which so effectively aided the Government in selling the many millions of dollars worth of surplus material and equipment accumulated during the war without disturbing the market.

"SEARCHLIGHT"

One look at the general design of an Owen "K" Hi-speed Bucket and you'll agree it's rightly named. The steep pitch of the jaws for extra rapid discharge of material . . . no ledges or projections to obstruct or resist material entering or leaving bucket . . . less distance for closing blocks to travel for speeding up closing and dumping action . . . rapid reeving . . . all of which means faster, more economical rehandling with over-capacity efficiency.

There's no back-down on the Owen guarantee—"A bigger day's work than any other bucket of the same weight and capacity." Do you know of a stronger bucket guarantee?

Write for the special Owen "K" folder or a complete Owen catalog.

THE OWEN BUCKET COMPANY
6023 Breakwater Ave. Cleveland, Ohio

OWEN CLAMSHELL BUCKETS INSURE A BIGGER DAY'S WORK

Owen Buckets

Thousands say O.K. *for Compressed Air Work*

The O.K. Air Compressor gives the most air for your money on portable jobs and keeps the air tools working away all the time.

And the O.K. Air Compressor is powerful—a four-cylinder engine, with special device for idling when the load is cut off. There's a special O.K. clutch for starting the engine separately. A new type radiator, special valves—and other advantages which we'll tell you about if you'll write.

Some valuable territory still open to agents.

O.K. CLUTCH AND MACHINERY CO.
P. O. Box 305 Columbia, Pa.

The BEST at *any* Price!

KOLESCH Construction Transit

No. 7721

PRICE **$160**

This Transit is designed to meet the most exacting requirements of the Construction Engineer, and is *Kolesch Quality* throughout.

KOLESCH & COMPANY
138 Fulton St., New York, N. Y.
Established 1885

More Light for Less Money

Do you Investigate the Operating Costs of your Emergency Lighting? Some lights cost 6c. to 11c. an hour for 8000 Candlepower. The Milburn Furnishes 8000 Candlepower for only 3-1/3c. an hour.

Milburn Portable Carbide Lights are used by leading contractors who overlook no opportunity to make every saving that can be effected without sacrifice of efficiency.

Patented features, found only in Milburn Lights are responsible for these economies. Here are a few of these points:

1. **THEY FURNISH 8,000 C.P. FOR ONLY 3 1/3c. AN HOUR.**
2. **They burn either commercial or cake carbide.**
3. **Light can be turned off for any period and relit WITHOUT LOSS OF CARBIDE.**
4. **They work absolutely automatically.**
5. **They do not require a change of water when recharging the light.**
6. **They are practically self-cleaning.**
7. **They cannot be overcharged.**
8. **They combine all the good points of other lights with numerous exclusive patented features found in no other lights.**

Let Milburn Carbide Lights save money for you too. Get full details.

Ask for Booklet No. 2498

THE ALEXANDER MILBURN COMPANY
1416-1428 W. Baltimore St. Baltimore, Md.

If interested in spray painting equipment or cutting and welding, ask for information on these subjects also

Construction Methods, Tenth Ave. at 36th St., New York, N. Y.

ENCLOSED FIND ONE DOLLAR
ENTER MY 2-YEAR SUBSCRIPTION TO CONSTRUCTION METHODS

Name .....

Address .....

City ..... State .....

Company Employed by or Business Connection....

.....

Nature of Business.... .....Title .....

For the man who borrows *your* copy of "Construction Methods"

We all know him. He doesn't mean to bother you. He really means it when he says he'll return your copy.

But you know that, for some reason or other, he seldom does.

Give this man the coupon - - - ,

Tell him for $1, he can get his *own* copy each month for the next two years.

Work at night with Carbic light and finish the job on time

CONTRACTORS and engineers are relying more and more on night work to keep up to schedules. They know that night work is productive if good light is supplied. They use the Carbic Light.

Because it is portable. The popular No. 2 light weighs only 115 pounds fully charged.

Because it is always ready. The Carbic Light is so simple in construction it can be charged in three minutes to burn for twelve hours.

Because it is economical. Costs only a few cents an hour to operate.

Thousands of Carbic Lights are being used today for every kind of night construction work.

Your jobber can supply you.

Style No. 2

CARBIC LIGHT

OXWELD ACETYLENE COMPANY
Unit of Union Carbide and Carbon Corporation

New York City
30 East 42d Street

UCC

Chicago
Peoples Gas Bldg.

San Francisco, Adam Grant Building

Carbic is distributed by the Union Carbide Sales Company through its national chain of warehouses and is sold by jobbers everywhere.

PROOF

that the tractor shovel does this work at a lower cost

THIS machine was installed on a trial basis for the Bronx Gas & Electric Co., Bronx, New York, and accepted by them after their cost experts and accountants had checked its operation and compared the costs with their former methods. They found that the Tractor Ditcher could handle this trenching at a lower cost.

With a 24 inch trench hoe attachment it digs this trench for the 12 inch cast iron gas main pipe to an average depth of 4 ft. Two men with asphalt cutting blades go ahead of the ditcher and cut a line on each side, through the 3 inches of asphalt and 8 inches of concrete. The ditcher goes the rest.

Write for new Bulletin T-4 describing this profit-making *Convertible Tractor Shovel.*

Bay City Dredge Works

New York Office
302 Broadway

Bay City, Mich.

BAY-CITY

FULL OR PART CIRCLE — SHOVELS — TRENCHERS — SKIMMERS

This is Your Ticket

For a Free Tour of Over 50 Contracting Layouts

Here's a chance to make a free inspection tour of over 50 progressive contracting jobs, without going outside of your own door. Barber-Greene men have gathered information, pictures and layouts on interesting features of contracting work in every section of the country. The best of these have been collected in the 1927 edition of *Contracting with Barber-Greenes.* Sending this ticket brings your copy—send it today.

Name .....

Address .....

City ..... State .....

Company .....

BARBER-GREENE CO. *Representatives* **530 W. Park Av., Aurora, Ill.** *in Fifty Cities*

BARBER GREENE

Portable Belt Conveyors — Self Feeding Bucket Loaders

Coal Loaders . . . . . Automatic Ditch Diggers . . . . . Coal Feeders

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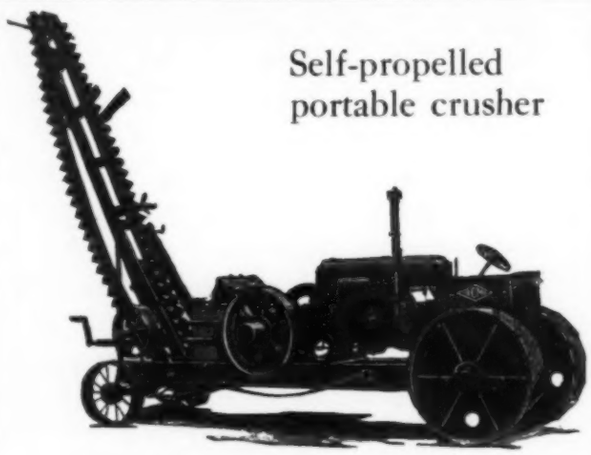
Self-propelled portable crusher



ACME Crushers

THERE are Acme Stone Crushers suited to practically any stone crushing job. Portable or stationary.

The self-propelled portable crusher shown here is a big time and money saving unit. Can be moved under its own power direct to any stone supply along the road and then put immediately to work by a single shift of the clutch. Users say Acme Plants can't be beat for field and road work.

We manufacture a complete line of Crushers, Rollers and Graders. Ask for Catalogs.

Acme Road Machinery Co.
Frankfort, N. Y.

"TRENCHMARINE"

announces

the MIDGET

Centrifugal Pumping Outfit

Direct Connected to AIR COOLED Gasoline Engine

$100

F. O. B. N. Y.

FIG. 337 No. 1½ (The Midget)
WITH FOOT STARTER

Capacities to
2500 G.P.H.

USE:—

For pumping clear or dirty water from trenches, sewers, cellars, quarries, reservoirs, barges, ships and cesspools.

USED BY:—

Contractors, railroads, public utilities, shipyards, industrial plants, etc.

$160

F. O. B. N. Y.

FIG. 337 No. 2
WITH EASY PULL STARTER

Capacities to
8400 G.P.H.

WHY "TRENCHMARINE" PORTABLE CENTRIFUGAL PUMPING UNITS ARE IN GREAT DEMAND

1. They are self-contained — always ready for action.
2. Compact and light—easily transported—but not too light for hard work.
3. Capacities up to 8400 gallons per hour.
4. All parts easily accessible.
5. Air cooled—cannot freeze in cold weather—Runs cool in hot weather.
6. Four cycle engine—High tension magneto.
7. Open impeller pump—cannot clog.
8. Simple enough for any laborer to operate.

LOW FIRST COST **LOW OPERATING COST**

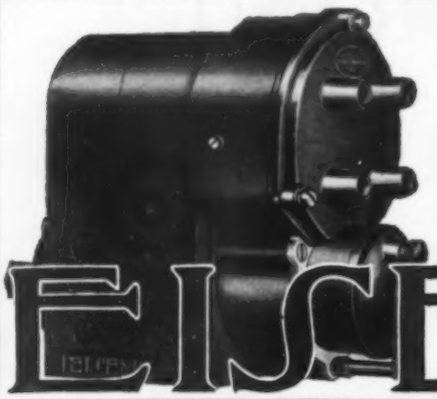
Write for Distributors Proposition.

CABLE ADDRESS
TRENCHPUMP, N. Y.

TRENCH & MARINE PUMP CO.

85 WARREN STREET, NEW YORK, N. Y.

MAKERS OF PUMPS
THAT PUMP



The Preferred Magneto

~for Construction Equipment

EISEMANN

The overwhelming choice of the builders of high quality equipment. Favored by contractors everywhere.

EISEMANN MAGNETO CORPORATION
165 Broadway - New York

EISEMANN

GET NEW LOW PRICES!

HIGHEST QUALITY CONSTRUCTION EVER USED

Amazing factors of strength and efficiency. Compare the BOSS Drum with the mixing drum of any outfit within $250 of its price. All steel, electrically welded, leak proof; 800-lb. less dead load for engine. Steel castings and forgings where strain is great. Hyatt Bearings save power and oil. Massive semi-steel gears. Alemite lubrication. Learn all the BOSS means to you.

High Speed Mixing and Discharge

Patented re-mixing action produces exceptionally strong, uniform aggregate—10 cu. ft. per batch. Finger touch discharge action—8 to 12 seconds. 10-12 h.p. multicylinder Novo and LeRoi engines. A fast-working, dependable outfit at a price that's RIGHT. Easy To Buy.

THE BOSS ONE-TWO BAGGER MIXER

Act NOW!

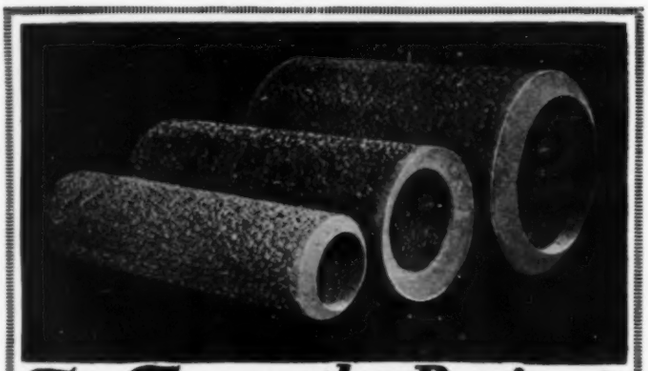
Look into this. Write today for money-saving facts and prices.

BOSS Mixers are built in all sizes and types.

BOSS Hoists—Single and Double Drum.

Write Today!

AMERICAN CEMENT MACHINE CO., Inc.
244 South Fourth Street KEOKUK, IOWA



Ten Times the Drainage Capacity of Other Pipes

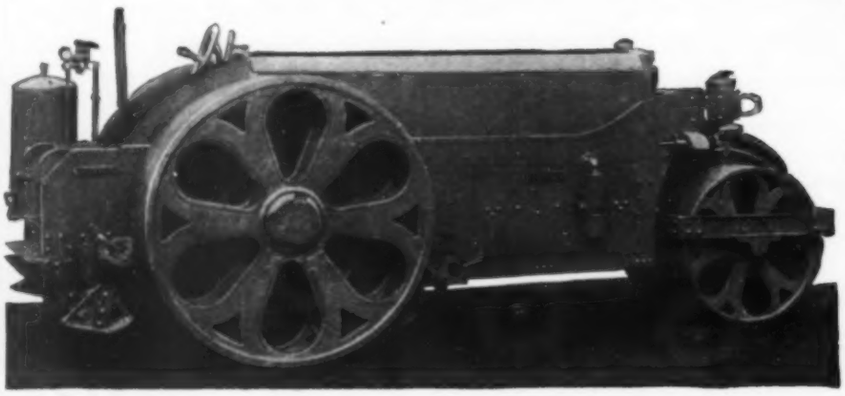
"A FOOT OF DRAINAGE FOR EVERY FOOT OF PIPE"

"The Water Seeps in and Then Flows Through"

"NO OPEN JOINTS"

Walker Cement Products, Inc.
Little Ferry N.J.
Plants at Little Ferry N.J. & Baldwin L.I. N.Y.

WALKER POROSWALL RAPID DRAIN PIPE



HUBER

4 CYLINDER
MOTOR ROLLERS

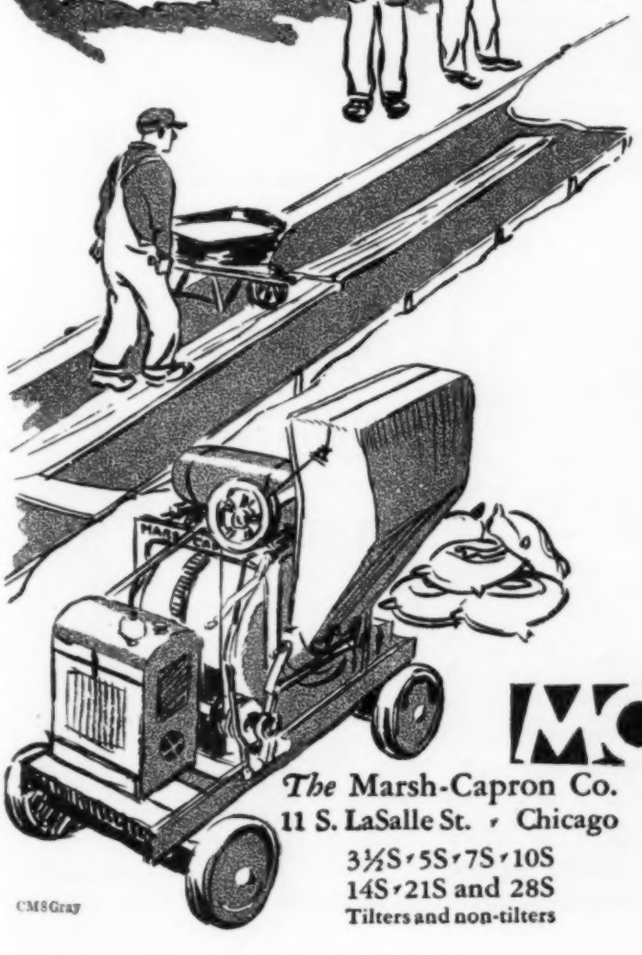
Powerful and dependable, quick in action, economical to operate. Made in 4 sizes (5-7-10-12 Tons). Send for Huber Motor Roller Catalog.

THE HUBER MFG. CO.
315 E. Center St., Marion, Ohio

for all-around service, the Marsh-Capron 7s

"What mixer will you use on your new apartment job?"

"This same Marsh-Capron 7S. Fast charging and fast discharging, it's the fastest unit I've ever used. Its rugged construction with Timken bearings, rail tracks, and a guaranteed drum have given me 75 to 90 yds. every day, year after year. It's profitable on all sorts of jobs—buildings, foundations, footings, sidewalks. You can't beat a Marsh-Capron 7S for all-around service."



The Marsh-Capron Co.
11 S. LaSalle St. • Chicago

3½S • 5S • 7S • 10S
14S • 21S and 28S
Tilters and non-tilters

CM8Gray

Jaeger Heavy Duty 10S Holds 2 Bags

1-2-5

Built of Steel
Lighter
50% Stronger

"Fastest Mixer I've Ever Owned," say Contractors

FASTER charging with big drum openings and Automatic Skip Shaker (no pounding); faster mixing, re-mixing drum action; faster discharge (8 to 11 seconds) and one man control throughout.

MORE PORTABLE than many a 7S. It's all-steel, 50% stronger, ½ ton lighter; short coupled and direct driven; roller bearing wheels, dual tires (half steel, half rubber) carry it over soft ground or paved street.

SMOOTHER running in all parts. Drum tracks of machined steel run on chilled ground faced rollers; direct steel gear drive operates in oil bath. ball bearings on reduction shafts and drum rollers save 19% of power, eliminate breakdowns.

AUTOMATIC SKIP SHAKER

Stops that man from pounding loader out of shape.

100% BALL BEARING

OTHER ADVANTAGES include Jaeger Accurate Measure Water Tank, renewable liner on discharge spoon. Prompt service anywhere from over 100 Jaeger Service Stations.

SPEED KING that Handy 7S!

Get our prices on this record breaking all-purpose trailer; also heavy duty sizes up to 28 ft. Tilters with loaders up to 14 ft. sizes.

Easy and Safe to Charge This Mixer!

MAIL THIS FOR CATALOG, PRICES AND TERMS!

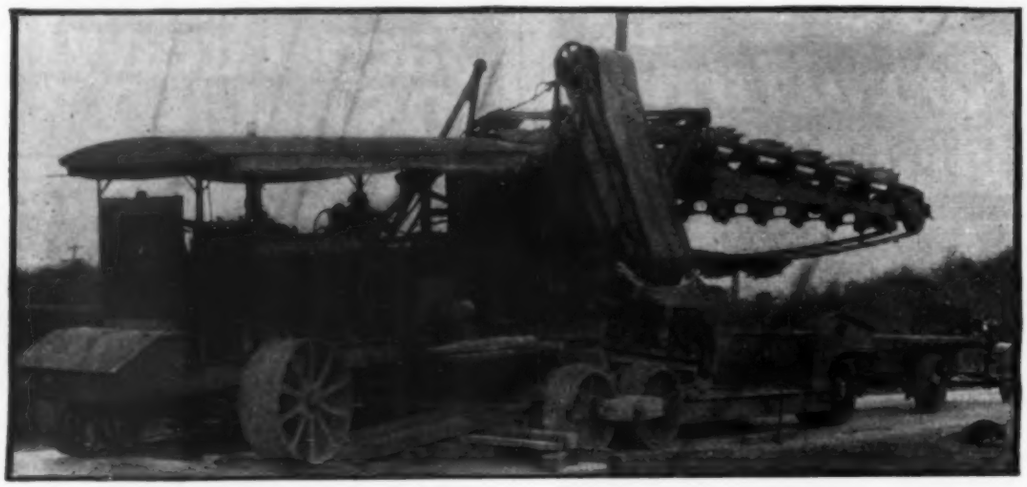
The Jaeger Machine Co. Date_____
800 Dublin Avenue, Columbus, Ohio

☐ NON-TILT MIXERS ☐ TILTERS ☐ PLASTER MORTAR MIXERS (Check where desired)

Name_____

Address _____

City_____ State_____



Easy For Contractors To Load

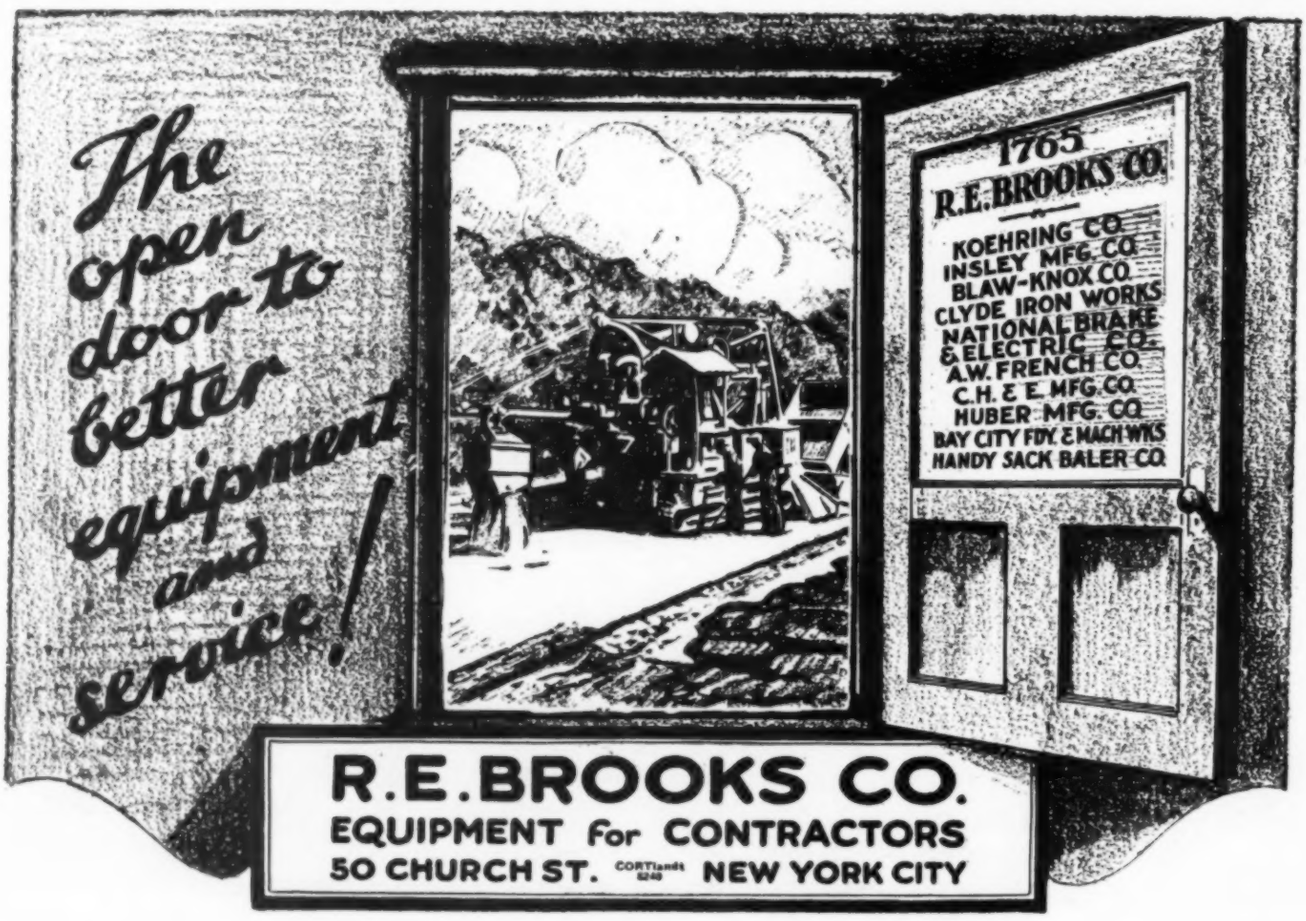
ONE of several reasons why many contractors can profitably employ Rogers Heavy Duty Gooseneck Trailers is the ease and speed with which they load.

There are no delays when a Rogers is used. Heavy machinery—up to 100 tons—is quickly transported over any highway.

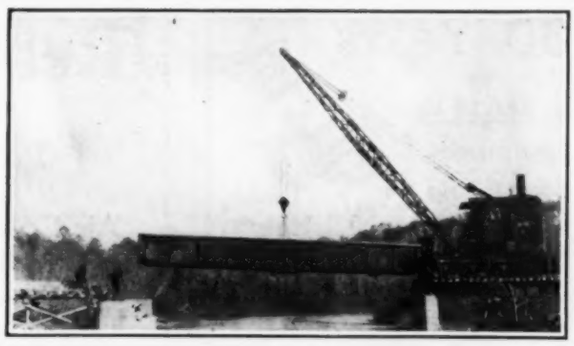
For in addition to loading facility, Rogers Trailers have an unusually short turning radius—more than 90 degrees. Their roadability is remarkable—rocking axles with 8 inches oscillation flatten out uneven roads.

Get the Rogers story. Find out how utilizing Rogers Heavy Duty Gooseneck Trailers will save you money. Write.

ROGERS BROTHERS CORPORATION, *ALBION, PENNA.*



JOBS
and
men to fill them



POSITIONS WANTED

Superintendents

ASSISTANT superintendent or general carpenter foreman on steam stations, industrial plants, cement plants, flat slab, heavy timber, etc.; location immaterial; available at once. PW-55, Construction Methods, Tenth Ave. at 36th St., New York.

BUILDING superintendent with 20 years of experience in all classes of construction: concrete, brick, wood and steel, deep foundation work; also concrete bridge construction. PW-56, Construction Methods, Tenth Ave. at 36th St., New York.

CONSTRUCTION engineer and superintendent, experienced in estimating and supervising highway and bridge construction; can handle several operations; organizer. PW-57, Construction Methods, Tenth Ave. at 36th St., New York.

CONSTRUCTION engineer, superintendent and estimator, 10 years' experience dam, docks and commercial buildings; graduate engineer, capable of complete charge of work. P. O. 76, Pensacola, Fla.

CONSTRUCTION superintendent, age 37, keen, competent, conscientious, energetic; 15 years' experience superintendence highest quality brick, steel, stone and lumber construction; any type job; nothing too difficult, harassing or distant. PW-58, Construction Methods, Tenth Ave. at 36th St., New York.

SEARCHLIGHT SECTION
Construction Methods
TENTH AVENUE AT 36TH ST., NEW YORK

ADVERTISING RATES

UNDISPLAYED—RATE PER WORD:

Positions Wanted, 6 cents a word, minimum $1.25 an insertion, payable in advance.

Positions Vacant and all other classifications, 10 cents a word, minimum charge $2.00.

Proposals, 50 cents a line an insertion.

DISPLAYED—RATE PER INCH:

1 to 3 inches.....$7.50 an inch
4 to 7 inches..... 7.25 an inch
8 to 11 inches..... 7.00 an inch

An advertising inch is measured vertically on one column, 2 columns—30 inches—to a page.

INFORMATION:

Box Numbers in care of any of our offices count 10 words additional in undisplayed ads.

Discount of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

POSITIONS WANTED

CONSTRUCTION superintendent, 15 years' experience, pile driving, excavation, foundation bridges, grade crossing elimination, viaducts, reinforced concrete and steel building, road construction, residences; have first-class organization; have best of references. PW-59, Construction Methods, Tenth Ave. at 36th St., New York.

POSITIONS WANTED

SUPERINTENDENT of sewers, age 37, desires position with reliable contractor; experienced difficult excavations, heavy timbering, concrete; just completing concrete storm drains; salary $325. PW-60, Construction Methods, Tenth Ave. at 36th St., New York.

Miscellaneous

CONCRETE and labor foreman likes to locate with reliable contractor; good reference, sober, reliable; New York vicinity preferred, but will go anywhere. PW-61, Construction Methods, Tenth Ave. at 36th St., New York.

ENGINEER — Recent graduate concrete construction, wishes part or full time work of any kind, including research. PW-64, Construction Methods, Tenth Ave. at 36th St., New York.

FOREMAN (43), twenty years' experience as structural iron and reinforcing steel foreman on all kinds of construction. PW-62, Construction Methods, Tenth Ave. at 36th St., New York.

MASTER mechanic, dredge engineer, maintenance superintendent, 20 years' experience in all lines construction work; married; best references. PW-63, Construction Methods, Tenth Ave. at 36th St., New York.

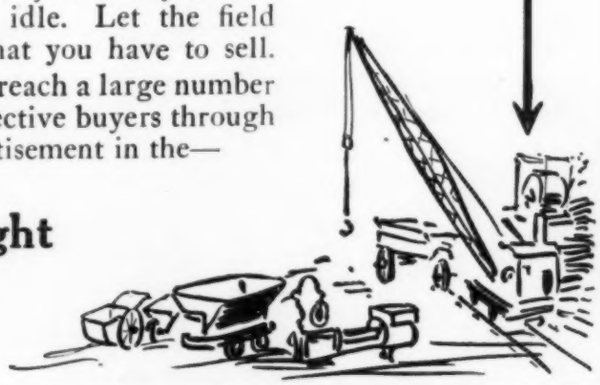
In Your Yard—

There is undoubtedly equipment that you won't use again. It's still in good, serviceable condition. It ought to be working for someone.

A number of contractors may now be looking for just what you have standing idle. Let the field know what you have to sell.

You can reach a large number of prospective buyers through an advertisement in the—

Searchlight Section
of
Construction Methods



SHOVELS, CRANES AND DRAGLINES

1—P. & H. 206 gas cat. comb crane and shovel, new 1924.
2—Link Belt gas cat. cranes K1 and K2 2 yrs. old.
Link Belt Shovel and Crane attachments for K2 machine.
NW shovel attachment for NW 104 1¼-yd. dipper. dipper.
1—20 ton Brown Hoist, 8 wheel loco. crane std. gg. 50-ft. boom.
1—McMyler gas. cat. crane 40-ft. boom, new 1925.
1—Osgood 1¼-yd. steam cat. shovel—like new—will rent.

MISCELLANEOUS

1—Jordan 80,000-lb. capacity all steel Air Spreader; will rent.
46—1½ yd. 24-in. gg. Koppel V shaped Dump Cars; will rent.
50—1½ yd. 24-in. gg. Western Wooden Dump Cars; will rent.
26—5 yd. 36-in. gg. Western Dump Cars, steel sills; will rent.
50—12-yd. std. gg. Western Dump Cars, steel sills; will rent.
4—16 and 18 ton 36-in. gg. steam saddle Tank Locomotives.
5—25 to 30 ton std. gg. steam saddle Tank Locomotives, American.
1—45-ton stud. gg. American saddle Tank Locomotive, guaranteed cond.
1—180 ft. 24-in. Beltt Conveyor, Weller.
1—70-ft. centers—No. 5 Welle bucket elevator.
1—Batch Hopper for model 25 Barber Green loader.
1—No. 1 Gates Gyratory crusher.

We also have good bargains in Crushers, Conveyors, Compressors, etc. Send us your inquiries.

Houck Bohan Equipment Co.
178 W. Adams St., Chicago. Frank 2468

32000 contractors and other construction men will see this page. Write today for complete advertising rates and other information

30 Years in RAILS

Equipment
Steel Piling
Pipe

Tanks,
Hoists,
Cranes,
Shovels,
Oil Engines,
Etc.

ZELNICKER'S BULLETIN

Write for our 368th Edition

ZELNICKER
ST. LOUIS

Entire Plant and Equipment For Sale

Sears Roebuck and Company Operation, Boston, Massachusetts, comprising Insley Towers, Floor Hoppers, Barber-Greene Belt Conveyors, Koehring, Knickerbocker and Rex Concrete Mixers, Chicago Booms and Fittings, Radial Bottom Open Gates, Lidgerwood Double Drum Hoists, Elevator Platforms, Lansing and Knickerbocker Mortar Mixers, Knickerbocker Bench Saws, Centrifugal Pump, Aggremeters, Cement Bag Cleaners, Hoisting Cable, Tarpaulins, Concrete Buggies, Wheelbarrows, Portable Shanties and a complete line of small tools and equipment.

An itemized list of equipment may be secured upon request. Inquiries should be directed to Purchasing Department,

Hegeman-Harris Company, Inc.
Brookline Avenue and Audubon Road,
Boston, Massachusetts

Largest Stock of Used Surveying Instruments in this Country

Satisfaction guaranteed or money refunded. Write for complete list and catalog of our high grade instruments and supplies for civil engineers, surveyors, mining, builders, contractors, etc.; 40 years' experience in repairing instruments of all makes at reasonable prices. Prompt service.

WISSLER INSTRUMENT CO.
615 N. Broadway, St. Louis, Mo.

RAILS

DEPENDABLE SERVICE

Track Supplies Contractor's Plant

E. C. SHERWOOD, 49 CHURCH STREET NEW YORK

O & S Gasoline Crane

40-ft. boom, used 5 months, like new, wheel traction. Priced low for cash.

HUNTER MACHINERY CO.
Milwaukee, Wis.

"Opportunity" Advertising:
Think
"SEARCHLIGHT"
First!

Rebuilt and Guaranteed

Partial List Pumps and Compressors

Air Compressors—Belted
24x16 in. Bury.
12x12 in. Laidlaw-Dunn-Gordon.
10x10 in. Ingersoll-Rand.
9x9 in. Curtiss Duplex.
6x6 in. Chicago, Model G.S.B.

Air Compressors—Steam
7x8x8 in. Marsh.
4x3x6 in. American.
4x3x5 in. Union.

Centrifugal Pumps
2—10 in. Allis-Chalmers.
1—10 in. Special.

Steam Pumps
9x7x12 in. Worthington Duplex.
7½x4 in. Laidlaw-Dunn-Gordon-Duplex.
4½x8 in. Deming Triplex.
8x5x8 in. American.
7½x7x7½ in. National.

Also All Kinds of Metal Working Machine Tools, Approximately 3,000 to Choose From

Riverside Machinery Depot
The Used Machinery House
251 St. Aubin Ave., Detroit, Mich.

Why buy wood sheeting?

You can save money by renting Steel Sheet-Piling from Wemlinger, Inc.—and do a more satisfactory job.

We maintain stocks of Steel Sheet-Piling throughout the country, for sale or for rent.

Wemlinger, Inc.
149 Broadway, New York

STEEL SHEET PILING

LINDHEIMER SUCCESSFUL PERFORMANCE SOLD-AGC-A-TON SERVICE

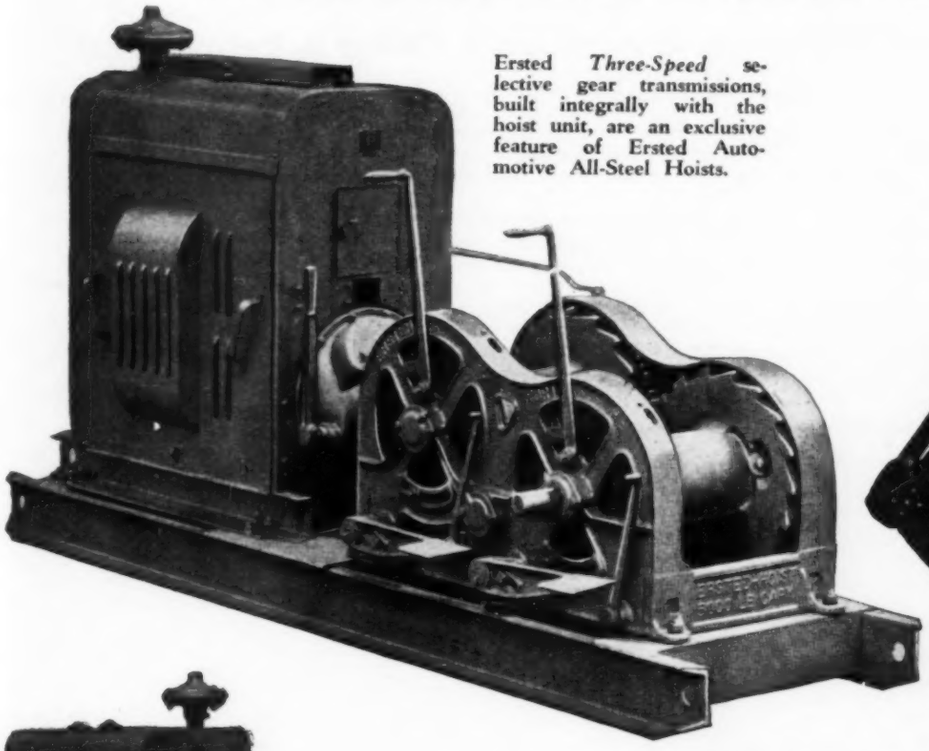
Saves you money and trouble in Foundation, Cofferdam, and Sewer work.

Bought-Sold-Rented—Always carried in stock

LONG DISTANCE TELEPHONE: CENTRAL 0491

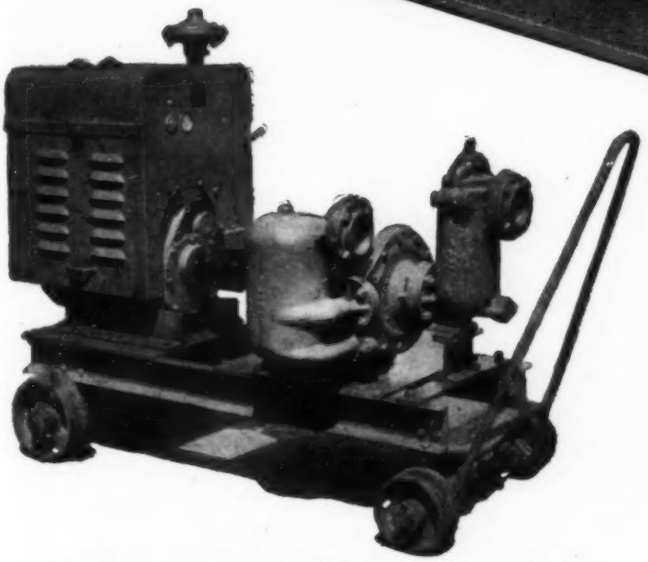
S·W·LINDHEIMER
31 South Clark St. CHICAGO

FOR SALE OR RENT



Ersted *Three-Speed* selective gear transmissions, built integrally with the hoist unit, are an exclusive feature of Ersted Automotive All-Steel Hoists.

"Brownhoist" Buckets. Types and sizes to fit every handling need. Rugged, Powerful. You know what the name means.



La Bour Centrifugal *Self-Priming* Pumps. Moderate Speed, Large Clearance, No Valves, Permanent or Portable. Gasoline or Electric.

"Headquarters" for Good Equipment

Not the least part of our business is co-operation with contractors—"service" that means supplying the equipment and seeing that it gives satisfaction.

Get in touch with us first and save time and money.

MOTT & McELRATH ENGINEERING CORP.

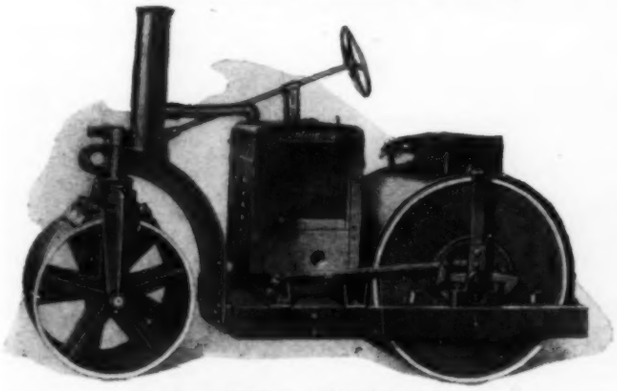
249 WEST 18th STREET, NEW YORK CITY

Phone Watkins 8588-8589-8590

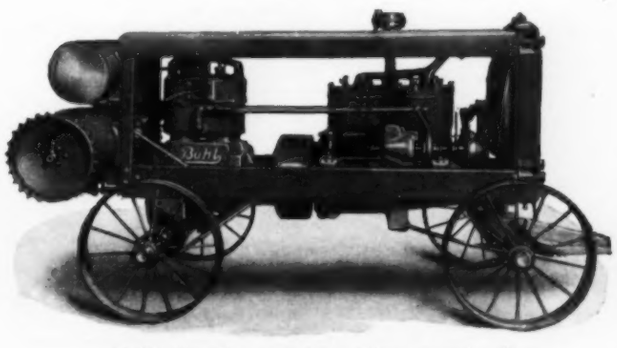
Branch Office:

MACHINERY EXHIBITS & SALES DEPARTMENT

Bourse Building, Philadelphia, Pa.



Pierce Rollers. Weight can be varied from 1½ to 2 tons.



Buhl Air Compressors. Sizes to suit all requirements.

Who's Getting the Big Contracts?

A Monthly Guide to Where the Construction Dollar is Being Spent

ON THIS PAGE *Construction Methods* lists some of the high-spot jobs for which important contracts have recently been let.

If you are looking for equipment prospects or for an employment opening in new territory, the information on this page may be of help in indicating where construction is active.

The contracts listed are, of course, only a few of the total number recently let. You may wish to ask about others. If so, address your inquiries to:

Searchlight Dept., *Construction Methods*, Tenth Ave. at 36th St., New York

Far West

Richmond, Calif.
Wharf and cargo building: $534,000
Pan-Pacific Piling & Constr. Co., 2779 Poplar St., Oakland.

Seattle, Wash.
Store and office building: $300,000
West Coast Constr. Co., Lloyd Bldg., Seattle.

Seattle, Wash.
Paving: $268,445
Moceri Bros., 924 Twenty-third Ave., and others.

Pasadena, Calif.
Sewers: $268,110
M. Limunovich, 3305 W. 66th St., Los Angeles.

March Field, Calif.
Barracks: $675,815.
Mittry Bros., Detwiler Bldg., Los Angeles.

San Francisco, Calif.
Office and loft: $500,000
Cahill Bros., 206 Sansome St.

Oakland, Calif.
Office building: $1,500,000
Cahill Bros., 206 Sansome St., San Francisco.

California
Paving: $226,107
Mathews Constr. Co., Forum Bldg., Sacramento.

Eugene, Ore.
Hydro-electric plant: $1,029,231
A. Guthrie & Co., 552 Sherlock Bldg., Portland, Ore., and others.

Berkeley, Calif.
College building: $500,000
P. J. Walker Co., Sharon Bldg., San Francisco.

Seattle, Wash.
School: $404,500
H. Pederson, 1105 Second Ave.

Electric Park, Ore.
Steam generating plant: $1,500,000
Sanderson & Porter, 52 William St., New York.

Reno, Nev.
Telephone exchange: $175,000
Monson Bros., 475 Sixth St., San Francisco.

Los Angeles, Calif.
Apartment: $375,000
Wesco Constr. Co., 2612 West Temple St.

San Francisco, Calif.
Paving: $224,347
L. J. Clion, 115 Montgomery St.

West of Mississippi

San Angelo, Tex.
Hotel: $1,000,000
R. E. McKee, El Paso.

Dallas, Tex.
Apartment hotel: $430,000
Churchill Humphrey Co., Magnolia Bldg.

St. Louis, Mo.
Hotel: $1,000,000
Wm. H. & Nelson Cunliff Co., 410 No. Euclid Ave.; Climer builds.

Hastings, Nebr.
Temple: $253,750
John Loff & Sons, 4012 Lake St., Omaha.

Montana
Paving: $340,946
J. M. Brown & Son, Bozeman, Mont., and others.

St. Louis, Mo.
Paving: $284,248
Perkinson Bros. Constr. Co., 3237 Carter Ave., and others.
Nurses home: $300,000
Selden Breck Co., Fullerton Bldg.

Dallas, Tex.
Theatre and apartment: $430,000
Churchill & Humphrey, Bur Bldg.

St. Louis, Mo.
Hotel: $1,300,000
Kopeman Constr. Co., 4225 Lindell Blvd.

Minneapolis, Minn.
Office building: $2,500,000
National Contr. Co., 311 Metropolitan Bank Bldg.

Texas
Paving: $762,242.
Howard Kenyon Dredging Co., 3603 McKinney St., Houston, and others.

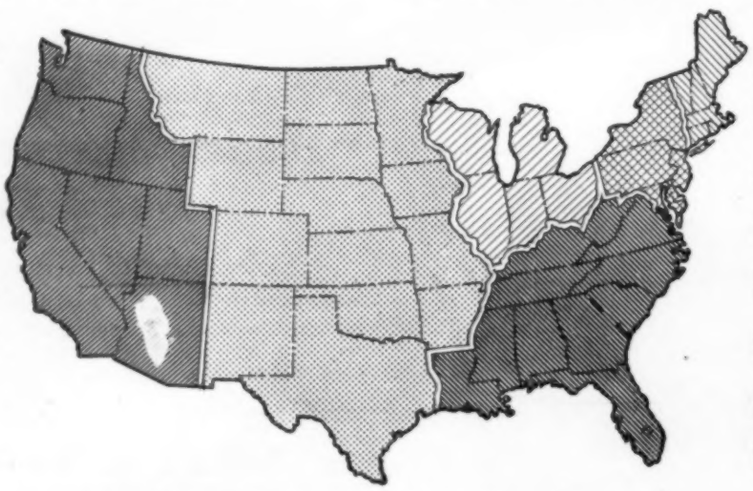
St. Louis, Mo.
Dikes: $880,700
Woods Bros. Constr. Co., 132 So. 13th St., Lincoln, Nebr.

Oklahoma City, Okla.
High school: $417,100

South Bend, Ind.
Depot, N. Y. C. & St. L. R.R. Co.: $500,000
Walsh Constr. Co., 114 W. Third St., Davenport, Ia.

Dayton, O.
Office building: $500,000
H. R. Blagg Co., 1229 E. Third St.

Cleveland, O.
Telephone Exchange: $350,000



Tankersley Constr. Co., Herskowitz Bldg.

Minneapolis, Minn.
Nurses home: $400,000
Madson Constr. Co., 618 Nat'l. Bldg.

Pyote, Tex.
Refinery: $200,000
Graver Corp., Pyote.

Middle West

Lake Forest, Ill.
School and church: $360,000
Noonan Constr. Co., 176 West Adams St.

Chicago, Ill.
Schools: $640,300
A. & E. Anderson Co., 228 North La Salle St. ($321,400) Simpson Constr. Co., 1113 So. Hermitage Ave. ($318,900).
School: $1,298,725
Great Lakes Constr. Co., 306 So. Wabash Ave.

Pontiac, Mich.
Automotive plant: $2,000,000
W. E. Wood Co., 1805 Ford Bldg., Detroit.

Chicago, Ill.
Office building: $2,500,000
Lundorf-Bicknell Co., 180 No. Michigan Ave.
Apartment: $750,000
T. D. Randall, 1609 Howard St., owner; to build by day labor.

Lundorf-Bicknell Co., B. F. Keith Bldg.
Club house: $1,600,000
Thompson-Starrett Co., 250 Park Ave., New York.

Illinois
Paving: $1,003,724
Cast Stone Constr. Co., Eau Claire, Wis., and others.

Indiana
Paving: $371,990
McAfee & Smith, Bluffton, Ind., and others.

Ohio
Paving: $310,696
C. E. Edington, Findlay, O., and others.

Indianapolis, Ind.
Church: $350,000
L. Colvin, Continental Bank Bldg.

New England

Waterbury, Conn.
Machinery plant: $200,000
Immick Co., State St., Meriden.

Fitchburg, Mass.
Theatre: $350,000
P. Rich & Son, 60 Scollay Sq., Boston.

Boston, Mass.
Hospital: $1,000,000
Stone & Webster, Inc., 49 Federal St.

New Haven, Conn.
Paving: $472,528
Blakeslee & Son, 58 Waverly St., New Haven, and others.

New Hampshire
Paving: $226,604
A. D. Bridges & Sons, Inc., Hazardville, Conn., and others.

Roslindale, Mass.
Bank: $150,000
P. Basile, 22 Taft Place, owner, by separate contracts.

Lynn, Mass.
Club: $150,000
C. H. Cummings & Son Co., 23 Central Ave.

Dorchester, Mass.
Apartments: $150,000
A. J. Marks, 131 Columbia Rd., owner by separate contracts

Boston, Mass.
Office building: $150,000
Canter Constr. Co., 6 Beacon St.

Middle Atlantic

Baltimore, Md.
Bank and office building: $3,000,000
J. Henry Miller, Inc., Eutaw and Franklin Sts.

Lynbrook, N. Y.
Theatre: $1,000,000
McAndrew Constr. Corp., 1457 Broadway.

New York, N. Y.
Hotel: $2,000,000
Thompson-Starrett Co., 250 Park Ave.
Apartment: $1,000,000
Colmed Realty Co., 475 Fifth Ave., owner; by separate contracts.

Buffalo, N. Y.
Telephone exchange: $1,500,000
J. W. Cooper, Fidelity Bldg.

Pennsylvania
Paving: $976,450.
Sherman & Rhodes, Weissport, Pa., and others.

Jackson Heights, N. Y.
School: $519,800
Concord Constr. Co., 476 Seneca Ave., Brooklyn.

Meadville, Pa.
Factory: $1,000,000
J. P. Pettyjohn Co., Lynchburg, Va.

Mechanicsville, N. Y.
Paper mill: $500,000
Morton C. Tuttle Co., 31 St. James Ave., Boston.

Brooklyn, N. Y.
Factory and warehouse: $2,218,000
White Constr. Co., 95 Madison Ave., New York.

Washington, D. C.
Auditorium: $1,875,000
G. A. Fuller Co., Munsey Bldg., Washington

Baltimore, Md.
Warehouse: $568,900
P. C. Street Eng. Co., 404 St. Paul St.

South

Tuscaloosa, Ala.
Bag factory: $300,000
C. A. D. Bayley & Co., Inc., Atlanta, Ga.

Memphis, Tenn.
Apartment: $700,000
S. & W. Constr. Co., Shrine Bldg.

Jackson, Miss.
Hotel: $375,000
Seaboard & Southern Constr. Co., Atlanta, Ga.

Charlotte, N. C.
Paving: $390,374
Murray Constr. Co., Holston Nat'l Bank Bldg., Knoxville, Tenn.

South Charleston, W. Va.
Levee, $200,000
Ohio River Dredging Co., Huntington.

Louisville, Ky.
Tobacco factory: $500,000
L. W. Hancock & Co., Louisville Trust Bldg.

Abingdon, Va.
Milk condensery: $200,000
Pet Milk Co., St. Louis, Mo., owner, by day labor.

Vicksburg, Miss.
Hotel: $550,000
Separate contracts under supervision H. L. Stevens & Co., archts., 30 No. Michigan Blvd., Chicago.

Mobile, Ala.
Store: $160,000
Bowen Constr. Co., El Paso, Tex.

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A Watson-Stillman Hydraulic Bender Bending Conduit Pipe for Subway Work. Note that but three men are needed in the crew.

DO YOU BEND MUCH PIPE?

If you do you need a

Watson-Stillman Hydraulic Pipe Bender

These machines are not only rapid and economical of labor, but the bends are made uniform and without danger of buckling or crushing.

We build pipe benders in a variety of types and sizes as well as a full line of Hydraulic Machinery, including jacks, pumps, accumulators, presses, shears, etc.

Write for catalogs.

THE WATSON-STILLMAN CO.
1014 Evening Post Bldg., New York City

Chicago, 549 W. Washington Blvd. Philadelphia, Widener Bldg.
Cleveland, Auditorium Garage Bldg. Detroit, 7752 Duboise St.

HUMDINGER PUMPS

Non-clogging, everlasting rubber ball valves, totally enclosed, running-in-oil jacks, bronze bushed bearings, all steel trucks, and enclosed engine crank cases make HUMDINGER PUMPS.

THE CONTRACTOR'S CHOICE

Full detail description given in Bulletin No. 1034 CM. Send for a copy.

RALPH B. CARTER CO., 126 Chambers St., New York
Factory: Hackensack, N. J.

No. 259

A washable work glove—think of it!

No. 259 Made of Buffed Elk. Outseams and all seams on back of hand protected.

Sabin Exclusive hold tight back—six inch canvas cuff—comfortable—easy to wear—easy to wash.

Price—$1.60 per pair. Send check, draft or money order.

Sabin Co.,—Gloves
536-40 W. Federal St., Youngstown, O.

Sabin Co.,—Gloves
536-40 W. Federal St.,
Youngstown, Ohio

Send me information on Sabin Gloves

Name .....

Address .....

.....

.....

If you wish a pair of No. 259 Gloves enclose $1.60 and check here ☐

CLYDE

HOISTS CLYDE DERRICKS

Clyde safety hoists and derricks are justly popular in Texas. The illustration is taken at the plant of the Dittlinger Lime Co., New Braunfels, the largest producers of limestone products in the state, and shows in use a Clyde 7½-ton steel derrick operated by a Clyde three-drum, 60 H. P. electric hoist with swinger.

You'll Take Pride In Your Clyde!

CLYDE IRON WORKS SALES CO.

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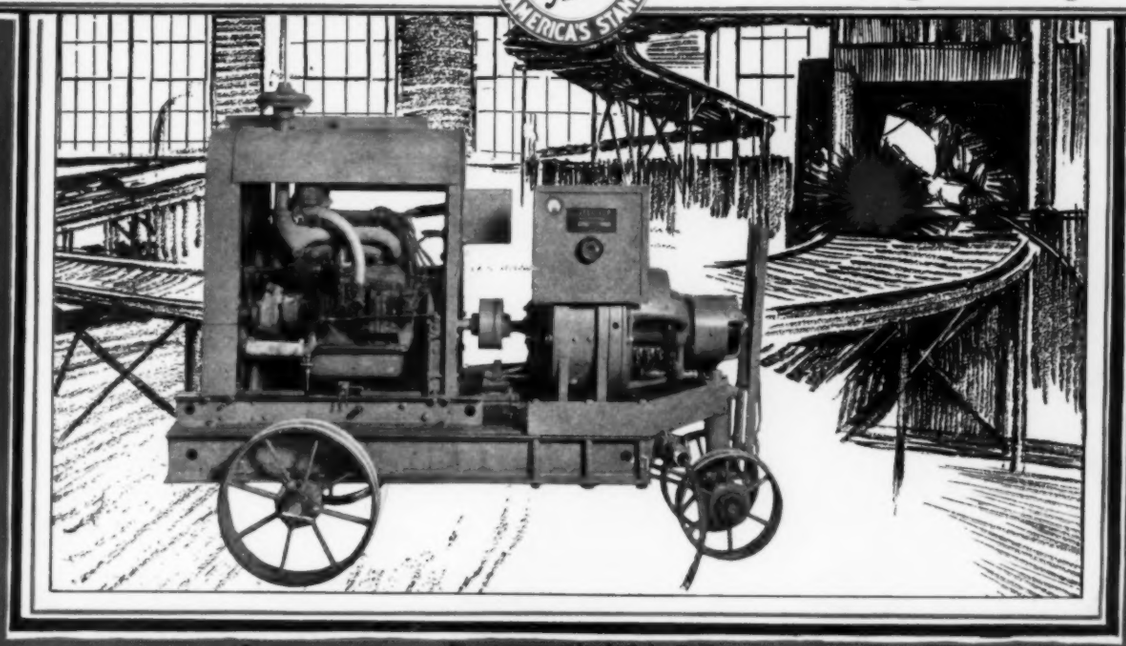
CLYDE TWO MARKS OF GUARANTEED QUALITY

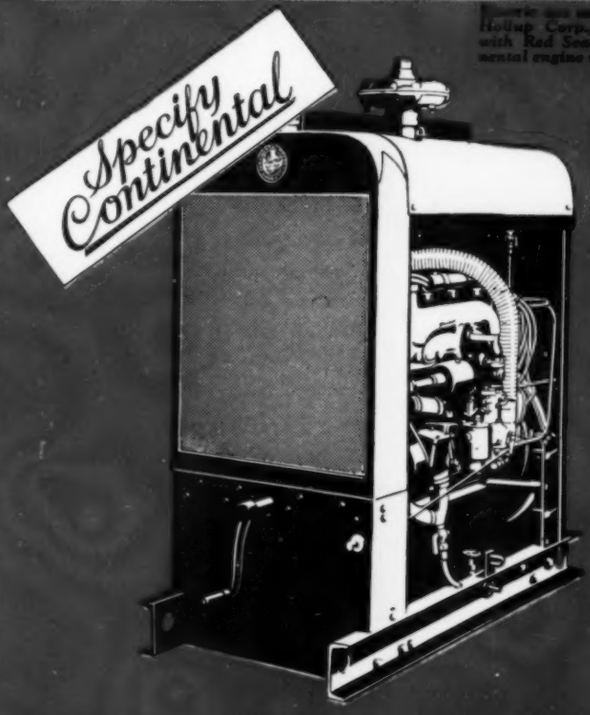
FOR SUCCESSFUL PERFORMANCE A·G·C·A

Dependable Power for Every Purpose

CONTINENTAL MOTORS — Powering the Nation — AMERICA'S STANDARD



Hollup Corp., Chicago, powered with Red Seal heavy duty Continental engine model P-20.



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The great usefulness and practicability of the gasoline engine for arc welding has resulted in manufacturers choosing this power almost 100%.

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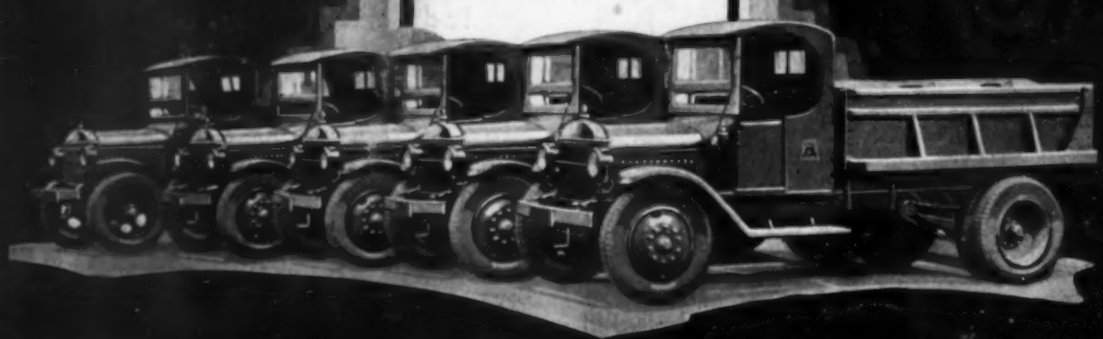

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